INCLUDING STUDENTS WITH DEVELOPMENTAL DISABILITIES IN SCHOOLS:
INSTRUCTIONAL STRATEGIES AND EDUCATIONAL OUTCOMES IN TYPICAL
AND "MULTIPLE INTELLIGENCES" ELEMENTARY SCHOOL CLASSROOMS

by

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Abstract

Previous research has demonstrated that specific instructional contexts, techniques, and service delivery models that provide opportunities for peer interaction and active engagement in instructional activities promote positive social and academic outcomes for students with and without disabilities (Bulgren & Carta, 1993; Fisher et al., 1995; Grenot-Scheyer, 1994; Kamps, Leonard, Dugan, Boland, & Greenwood, 1991; Lee & Odom, 1996; Logan et al., 1998). It has been suggested that Multiple Intelligences (MI) theory provides a framework that includes many of these inclusive pedagogies and techniques (Armstrong, 1994; Hoerr, 1996). The present study was intended to explore the extent to which MI theory and instruction facilitates the inclusion of participants with developmental disabilities.

Ten elementary school students (ages 6-12) with developmental disabilities participated in this study. The students were included in two types of general education classrooms: those in which MI pedagogy, instruction, and assessment were implemented, or those in which no specific educational theory or pedagogy was applied.

Data were collected using ecobehavioral assessment, which is designed to reveal interrelationships between environmental variables (e.g., instructional activities and groupings) and child behavior (Greenwood, Schulte, Kohler, Dinwiddie, & Carta, 1986). An online version of MS-CISSAR (Greenwood, Carta, Kamps, Terry, & Delquadri, 1994) was used to gather and analyze data regarding students’ instructional experiences, engaged behavior, and peer interactions. A matched-subjects design was used to compare the experiences of participants in the two types of classrooms; specifically, the relationships between types of task and instructional groupings and students’ social interaction and engaged behaviors were examined.
Results suggested that the experiences of the participants in both typical and MI classrooms were more alike than different. Participants in both types of inclusive classrooms were frequently involved in whole-class or independent seatwork and paper-and-pencil activities. Thus, rates of overall engaged behavior and social interactions were essentially equivalent. However, participants in MI classrooms were more frequently observed to be involved in activities that allowed for multiple methods of responding and in small group structures. In contrast, participants in typical classrooms had high rates of one-to-one, separate activities from those of their typical classmates, as well as relatively high rates of non-instructional time (i.e. “down time” or transition time). Perhaps as a result, participants in MI classes were observed to interact with their typical peers more frequently and to be actively engaged in learning more often, while participants in typical classrooms were observed to interact more with adults and to be more passively engaged. The results are discussed in terms of their educational and research implications, limitations, and suggestions for further research.
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CHAPTER 1

Introduction

In recent years, the educational systems in both Canada and the United States have undergone significant educational reforms, including a movement toward the inclusion of students with disabilities in regular education classrooms. Research has indicated there are many positive effects of placement in an inclusive versus special classrooms for students with developmental disabilities in particular (Baker, Wang, & Walberg, 1994-95). Recent research has suggested that inclusive classrooms do not hinder the academic achievement of typical students, and actually have many social and developmental advantages for students both with and without disabilities (Peltier, 1997; Staub & Peck, 1995). If all students are to be taught together in general education classrooms, it is important that teachers utilize inclusive teaching techniques that allow them to succeed both academically and socially.

The theory of multiple intelligences (MI) (Gardner, 1983) is a regular education reform movement which appears to include many of the teaching philosophies, techniques, and assessment methods found to be effective for students both with and without disabilities. Based on Howard Gardner’s research with typical children and adults and those with brain injuries at Harvard’s Project Zero (Gardner, 1983), MI challenges current theories surrounding intelligence, learning, teaching, curriculum, and assessment (Blythe & Gardner, 1990). Gardner postulated seven different intelligences (Gardner, 1983), and later added an eighth (Checkley, 1997), as an alternative to the current single intelligence construct reflected in traditional IQ measures. Gardner believes that traditional curricula and instructional techniques utilize only two of the eight intelligences, verbal-linguistic and logico-mathematical (Gardner, 1995), and therefore create an educational disadvantage by which some students are
favoured over others (Hearne & Stone, 1995). He suggested revising curricula, instructional, and assessment techniques to reflect a greater balance with regard to the use of all eight intelligences, thereby providing children whose strengths lie in the six less-utilized intelligences greater opportunities to succeed. Thus, MI practices have often been cited as appropriate and facilitative of inclusion, since they are designed to accommodate a diverse range of learners (Armstrong, 1994; Eichinger & Downing, 1996; Falvey, Givner, & Kimm, 1996).

This research was designed to investigate the extent to which MI practices facilitate inclusive outcomes for elementary-aged students with developmental disabilities. Specifically, 10 such students (5 matched dyads) will be observed in their respective general education classrooms; five students will attend classrooms that ascribe to MI theory and practices and the other five will attend classrooms considered to be “typical” inclusive classrooms. Comparisons will be made across the two groups of students with regard to a number of outcomes that have been found in previous literature to be associated with inclusion. In the sections that follow, the concepts of inclusion and MI theory will be introduced and defined. In addition, the general characteristics of the population of interest, students with developmental disabilities, will be summarized. Finally, the main research questions will be stated.

Inclusion

History of Inclusion in B.C.

Canadian laws regarding the inclusion of individuals with disabilities into society were affected by significant constitutional changes in the 1980’s (Horrocks, 1993; McBride, 1989). In 1981, the Charter of Rights and Freedoms prohibited discrimination on the basis of race,
national or ethnic origin, color, religion, gender, or age. A 1985 amendment added mental or physical disability to this list. The legal protection of this new reality was then accompanied by a slow shift toward deinstitutionalization and the inclusion of individuals with disabilities into their local communities. However, a 1990 study found that 114,000 children and youth in Canada with mental handicaps were still being educated in segregated school programs (Horrocks, 1993). B.C.'s Sullivan Royal Commission on Education recognized that education was not just about skills, but also had a responsibility to foster the growth of community and to prepare all students, both with and without disabilities, to be contributing members of society (Horrocks, 1993). The result of this Commission was the development of the Year 2000 curriculum in B.C., which sought to develop “the whole child,” as opposed to just delivering knowledge or developing skills. This led to the belief that all children should be educated together, given that they were going to have to live and work together in society as adults (Horrocks, 1993). British Columbia's Year 2000 Primary Program, enacted in 1989, followed these currents of contemporary educational thought when it mandated the inclusion of all children, regardless of handicapping condition, in regular classrooms within their neighborhood schools (Cooper & Goldman, 1995). In so doing, the Year 2000 program was influenced by the changes in the Charter of Rights and Freedoms, the move towards deinstitutionalization, the Sullivan Royal Commission, and the Regular Education Initiative (REI) in the United States, which introduced the concept of least restrictive environment for education (McBride, 1989). This concept states that students should be provided the opportunity to be educated in “the least restrictive environment possible,” and, most often, this results in students being placed in regular education classrooms (Alper & Ryndak, 1992).
Definitions of Inclusion

Historically, the practice of placing students with disabilities in regular education classrooms has alternately been referred to as mainstreaming, integration, and more recently inclusion (Barth, 1996; Brinker & Thorpe, 1984; Daniel & King, 1997; Storey, 1993). To some extent, changes in terminology over the years have coincided with changes regarding the amount of time students with disabilities usually spent in regular classrooms. Mainstreaming, the earliest concept, reflected the practice of integrating students into regular classrooms for specific periods of the day, often for non-academic subjects (Daniel & King, 1997; Winzer, 1990). Integration, the term introduced next, often referred to the practice of placing students in special education classes as a home room, and then integrating them into regular classrooms for extended portions of the day (Brinker & Thorpe, 1984).

Definitions of inclusion have varied throughout the literature (Barth, 1996). Inclusion has often been confused with integration and mainstreaming, and historically these three terms have been used interchangeably. Barth (1996) argued that inclusion should be defined as "the merging of special education and regular education into a unified system. Student-centered individual learning needs are the focus" (p. 37). She defined integration as "the full participation of exceptional students in regular classrooms" (p. 37). By contrast, Daniel and King (1997) defined inclusion as "the placement of students with disabilities in regular education classrooms" (p. 67). They defined integration as only the partial participation of these students in regular classrooms. Thus, the intermixing of definitions for inclusion and integration continues to this day.

Definitions for inclusion are delineated somewhat more specifically when terms such as "full" and "partial" inclusion are used. Full inclusion is commonly defined as the placement of
all students with disabilities in regular education classrooms on a full-time basis, with accompanying special education services brought to the children within the regular classroom (Fuchs & Fuchs, 1998). Partial inclusion refers to the practice of placing students with disabilities in regular education classrooms for part or most of their day, while also continuing to provide special education pullout services (Fuchs & Fuchs, 1998).

Daniel and King (1997) employed yet another set of terms to define inclusion. They referred to "random inclusion" as the practice of placing students with disabilities proportionally across all classrooms in a given school. "Clustered inclusion" was defined as the practice of placing students with special needs only in a selected number of classrooms at a given grade level, with the result that the other classrooms at the same grade level include few, if any, students with special needs. Finally, "non-inclusion" was defined as the practice of placing students with special needs in separate classrooms for part of the day and in regular classrooms for another part of the school day. The authors pointed out that non-inclusion was equivalent to the practice of integration or mainstreaming as defined in earlier literature (Daniel & King, 1997).

King-Sears (1997) noted that inclusion as a term means different things to different people. However, she argued that much of the rhetoric around full inclusion in the literature is, in fact, a misrepresentation of reality. In a review of definitions of inclusion within the literature, she found that nowhere in the literature did any author state that all students with disabilities should always receive all of their instruction in general education classrooms; yet this is often what "full inclusionists" are said to demand (Fuchs & Fuchs, 1998). Therefore King-Sears defined inclusion as "students with disabilities attending the same schools as siblings and neighbors, being in general education classrooms with chronological age-
appropriate classmates, having individualized and relevant learning objectives, and being provided with the necessary support" (King-Sears, 1997, p. 2). In this definition, inclusion does not mean that students with disabilities must spend every minute of the school day in general education classes or must never receive small group or individualized instruction. It does, however, mean that students with disabilities should attend the same schools and classes that they would attend if they were not disabled, and that they should participate in the majority of their educational program alongside their peers.

The B.C. Ministry of Education defines inclusion as "the practice of providing equitable access to learning by all students and the opportunity for all students to pursue their goals in all aspects of their education" (B.C. Ministry of Education, 1998). Integration is referred to as the practice of placing students with special needs in classrooms with their age and grade peers, then providing them with the individualized supports, accommodations, and adaptations that are needed for them to be successful. This is in keeping with the definitions of inclusion and integration in Barth (1996), in which inclusion was defined as a philosophy, and integration as the resulting practice. It also supports the definition of inclusion provided by King-Sears (1997), in that it involves students attending their neighborhood schools, individualized goal setting, and a continuum of support services.

**Operational Definition of Inclusion**

Students in the school district in which this study was conducted were included in regular education classrooms according to the B.C. Ministry of Education definition of inclusion. They attended their neighborhood school, and were placed as full-time members in age appropriate regular education classrooms, using Daniel and King's (1997) "random inclusion" model. However, a continuum of support services continued to be provided within
each neighborhood school. Specialized pullout programming in resource rooms (e.g. remedial reading for a half-hour period several times a week), related services (e.g. speech-language pathology, occupational therapy, physiotherapy, etc.), and in-class supports such as resource teachers and classroom assistants were provided in small group or individualized settings within the schools for a limited time each week.

**Multiple Intelligences Theory**

In his landmark book, *Frames of Mind* (1983), Howard Gardner questioned the validity of measuring intelligence as a single construct by removing a person from his or her typical environment and testing his or her performance on isolated tasks that focus only on verbal-linguistic and logico-mathematical problem-solving skills. Gardner argued against the notion that a scientist who creates a new product is intelligent, but a musician who composes a new symphony is "talented." He noted that such distinctions are both value-driven (i.e., talent is less valuable than intelligence), and culturally-biased (e.g., in some cultures, music would be considered equally as valuable as science). Armstrong (1994) pointed out that many of the great geniuses of our time, including Einstein, would have fared poorly on IQ tests and might have been labeled as having a learning disability in the current educational system due to their difficulties with oral or written language. Thus, Gardner reconceptualized intelligence as the ability to solve a problem or create a product that would be considered useful in at least one cultural setting (Goldman & Gardner, 1989). He identified multiple, specific individual intelligences, based on a series of criteria that include both neurological and evolutionary components (Gardner, 1983).
Multiple Intelligences Theory and Education

MI's emphasis on individual learning styles challenges the prevailing practice of educating all students in the same subjects with the same methods and materials (Blythe & Gardner, 1990). Under this practice, "a learner" is one who masters the content and skills associated with a single curriculum delivered in lecture or written format, and who is able to demonstrate mastery through language-based assessments. Instead, MI conceives of all children as capable of learning and as possessing unique and diverse gifts, talents, and intelligences that contribute to the whole school (Teele, 1996). Research has demonstrated that when students are taught in a manner that is compatible with their learning styles, their standardized test scores in several academic areas increase (Albero, Brown, Eliason, & Wind, 1997; Mettetal et al., 1997). Gardner postulated eight different intelligences (Checkley, 1997; Gardner, 1983), as opposed to the current single construct reflected in IQ measures. These intelligences are: verbal/linguistic, logical/mathematical, bodily/kinesthetic, musical/rhythmic, visual/spatial, naturalistic, interpersonal, and intrapersonal. Brain research has documented some support for the neurological processes supporting each individual intelligence postulated by Gardner (Lazear, 1991a).

Gardner's work is significant because he has developed a framework for education that provides a more equitable approach for students with diverse learning profiles. He has pointed out that, because students have unique intellectual profiles, a standardized approach to education may inevitably neglect some students (Berger & Pollman, 1996; Hearne & Stone, 1995; Teele, 1996). MI proponents have suggested that curriculum must be responsive to students' interests, personal experiences, and range of abilities, and must be taught using multiple entry points to important concepts so that learning opportunities are maximized for
every child (Gardner, 1995; Teele, 1996). Students must take an active role in determining curriculum, choosing activities through which they will gather information, and selecting the methods through which they demonstrate learning, thus encouraging individualized instruction (Teele, 1996). This means that activities must be presented to allow students to learn through all eight intelligences, which places an increased emphasis on hands-on, active learning (i.e., using body/kinesthetic intelligence), as well as on visual/spatial and musical activities in schools. In addition, MI requires attention to developing co-operative and vicarious learning skills (i.e., through the interpersonal intelligence) as well as metacognitive skills (i.e., through the intrapersonal intelligence), all of which are also recommended in the literature on inclusion (King-Sears, 1997).

MI theory disputes the assumption that general success is predicated on success in verbal-linguistic and logico-mathematical activities and assessments (Gardner, 1983, 1993). Thus, it proposes a change from traditional testing practices that have a linguistic and logico-mathematical “filter” and are currently in use internationally (Blythe & Gardner, 1990). Instead, MI encourages informal, multiple means of assessment that focus on growth and progress in each student (i.e. observational and anecdotal, authentic assessments, as well as portfolios and criterion-based assessments for activities and projects), what each is able to do, and the best methods for setting future learning goals (Gage & Falvey, 1995; Gardner, 1995; Teele, 1996). Such curriculum-based assessment has frequently been identified as a key component of inclusive classrooms (Ellison, 1992; Plucker, Callahan, & Tomchin, 1996).

Gardner (1993) also proposed the creation of an “assessment specialist” (perhaps a former “resource” teacher) within the school, to aide teachers and students in assessing students strengths and weaknesses using MI-based assessment scales such as those designed
by Armstrong (1994) and Lazear (1991a). Using this approach, assessment becomes an integral part of the learning process that reaffirms, refocuses, and celebrates each student’s unique strengths, abilities, and progress towards their goals (Ellison, 1992). A collaborative approach to assessment, which includes both special and regular education teachers under MI theory, is meant to result in increased interactions between both regular and special education teachers and students. In this way, it is congruent with the practices of full inclusion (Armstrong, 1994).

MI theory has been implemented to some extent in classrooms and schools across Canada and the United States (Blythe & Gardner, 1990; Brownlie & MacDonald, 1996-97; Gardner, 1994; Mettetel et al., 1997), because of the belief that it offers all students more opportunities to learn and grow than do traditional teaching methods. MI appears to promote many of the same philosophies (e.g. the blending of special and regular education, involvement of community, seeing all students as learners, etc.), instructional practices (e.g. hands-on learning, co-operative learning, etc.), and assessment techniques (e.g., curriculum-based assessment, goal setting based on strengths, etc.) delineated in the research literature on inclusion. Thus, it has been cited frequently as an inclusive practice for students with special needs, and especially those with developmental disabilities (Armstrong, 1994; Eichinger & Downing, 1996; Evans, 1995).

Developmental Disabilities

Individuals with developmental disabilities have been described in many different ways throughout history (Winzer, 1990). Developmental disabilities is a broad term which historically (i.e., in past research studies) has included individuals with mental retardation, pervasive developmental disorders, multiple handicaps, deaf/blindness, and other congenital
disorders which lead to delayed development. Such individuals usually experience delays in areas of intellectual development (e.g. memory, information processing, problem solving, academic skills, etc.), and also have concomitant difficulties in adaptive behavior such as motor skills, social and communication skills, and emotional development (Winzer, 1990). For the purpose of this study, the definition of developmental disabilities includes students with intellectual impairments (mental retardation) and students with pervasive developmental disorders.

**Mental Retardation**

Estimates suggest that mental retardation occurs in approximately 1-3% of the population (The Roeher Institute). Accordingly, 899,000 Canadians, close to 74,000 of whom live in British Columbia, are considered to be mentally retarded (B.C. Statistics, 1997; Canadian Association for Community Living, 1999). Definitions for mental retardation have changed considerably over the past several years. In the 1970s, the classification system most commonly used in North America focused on the degree of intellectual disability as measured by standardized intelligence tests (IQ's) and adapted behavior scores (Grossman, 1977; Winzer, 1990). According to this definition, individuals with IQs between 55-69 had “mild mental retardation,” those with IQs between 40-54 had “moderate mental retardation,” those with IQs between 25-39 had “severe mental retardation,” and those with IQs below 24 had “profound mental retardation.”

In 1992, the American Association on Mental Retardation (AAMR) changed its definition to emphasize the level of support required by individuals with mental retardation rather than the level of their intellectual disability (Luckasson et al., 1992). According to this definition, people who require “intermittent” supports receive occasional services as needed;
people who require "limited" support receive consistent but time limited services; people who require "extensive" support receive daily, long-term services; and people who require "pervasive" support receive 24-hour per day services that are intense and perhaps even life sustaining. Thus, the new definition emphasizes individuals' abilities to adapt to their environments and to live independently, as opposed to their IQ scores. To further elaborate on the required levels of support, the new AAMR definition also emphasizes 10 adaptive skill areas. The resulting definition of mental retardation is as follows:

Significantly sub-average intellectual functioning, existing concurrently with related limitations in two or more of the following applicable adaptive skill areas:
communication, self care, home living, social skills, community use, self-direction, health and safety, functional academics, leisure, and work. Mental retardation manifests before age 18. (Luckasson et al., 1992, p. 1)

Objections to the term "mental retardation" have resulted from the negative connotations that are often associated with the term, as well as the limited expectations often associated with individuals so labeled (Rood, 1994). In addition, proponents for a change in nomenclature have argued that the terms mild, moderate, severe, and profound mental retardation are no longer relevant to the new definition. Self-advocates in British Columbia achieved a partial victory in this regard when, in 1996, the Board of Directors of the British Columbia Association for Community Living (BCACL) passed a resolution on behalf of the self-advocacy caucus stating that individuals with mental retardation wanted to be known as people with "developmental disabilities." Unfortunately, despite this resolution, and despite the AAMR suggestion of definition based on service, the B.C. Ministry of Education has continued to identify children with "intellectual impairments" according to the old mild,
moderate, severe, and profound categories as determined by intelligence testing (B.C. Ministry of Education, 1998).

Pervasive Developmental Disorders

Autism. Autism occurs in approximately 2 to 5 per 10,000 births, and has a higher incidence in males than females (American Psychiatric Association, 1994). The onset of autism occurs before age three. Autism is a neurological disorder that affects a child's ability to communicate, understand language, play, and relate to others. In the diagnostic manual used to classify disabilities, the DSM-IV (American Psychiatric Association, 1994), "autistic disorder" is listed as a sub-category under the heading of "Pervasive Developmental Disorders." Two thirds to three-quarters of autistic students also have cognitive impairments (Richard, 1997). A diagnosis of autistic disorder is made when an individual displays 6 or more of 12 symptoms listed across three major areas: social interaction; communication; and specific behavior patterns including preoccupation, resistance to change, adherence to nonfunctional routines and stereotyped and repetitive behaviors. In addition, there are a number of other characteristics associated with autism that do not have to be present for the diagnosis to be made. These include: short attention span/impulsivity; self-injurious behaviour; odd responses to sensory input; abnormalities of mood; an uneven profile of skill development; abnormalities in eating, drinking or sleeping; unusual fears or anxieties; and the presence of special abilities (Autism Society of America, 1999).

Pervasive developmental disorder-not otherwise specified (PDD-NOS). Pervasive developmental disorder-not otherwise specified is a developmental disability that, like autism, falls under the Pervasive Developmental Disorder axis in the DSM-IV (American Psychiatric Association, 1994). It occurs in 5-15 per 10,000 births (Richard, 1997). A diagnosis of PDD-
NOS is made when a profile best fits under the PDD major heading of axis 1, but does not meet the criteria for autism, Rett’s disorder, childhood disintegrative disorder, or Asperger’s disorder (Richard, 1997). Like individuals with autism, those with PDD-NOS also exhibit developmental delays in their ability to communicate, understand language, play, and relate to others. However, they have fewer symptoms, and thus do not meet the full criteria for autism.

**Operational Definition of Developmental Disabilities**

Participants in this study were identified using B.C. Ministry of Education definitions for mild, moderate, severe, and profound intellectual disabilities, as well as medical diagnoses of autism or PDD-NOS. The older definitions of “intellectual impairments” were chosen over the more current definitions proposed by the AAMR and the American Psychiatric Association because the study took place in the schools and identification of students for this study was therefore preceded by identification under B.C. Ministry of Education definitions.

**Statement of the Problem**

The opportunity to interact socially with typical peers has been shown to affect the social skills, self-concept, happiness, motivation, and achievement of students with developmental disabilities in positive ways (Grenot-Scheyer, 1994; Lee & Odom, 1996; Logan et al., 1998). Engaged behavior -- the active involvement of students with disabilities in learning, classroom activities, and interactions -- has also been found to promote social, academic, and communicative development (Bulgren & Carta, 1993; Kamps, Leonard, Dugan, Boland, & Greenwood, 1991; Sindelar, Smith, Harriman, Hale, & Wilson, 1989). Therefore, effective inclusion for students with developmental disabilities must promote both students’ social interactions and their engaged behavior.
Preliminary research has indicated that the implementation of MI curriculum has positive effects on typical students' motivation, engaged behavior, social skills and interactions, and academic achievement (Albero, Brown, Eliason, & Wind, 1997; Beuscher, Keuer, Muehlich, & Tyra, 1997; Dare, Durand, Moeller, & Washington, 1997; Mettetal, Jordan, & Harper, 1997). However, no research has investigated the effects of MI curriculum and instruction on the inclusion of students with developmental disabilities, despite the many theory-based suggestions that MI promotes curriculum and teaching strategies that are inclusive in nature. Thus, the present study is intended to provide a preliminary base of empirical data to explore the effects of an MI curriculum on the inclusion of elementary school-aged students with developmental disabilities.
CHAPTER 2

Literature Review

Inclusion and the theory of multiple intelligences (MI) represent two separate and distinct fields in the educational literature. While there is an extensive body of research investigating the effects of inclusion (particularly with regard to students with developmental disabilities), there is very little research regarding the effects of MI theory and teaching practices. Much of the literature on MI theory consists of theoretical papers and lesson or unit suggestions, none of which are empirical in nature. For example, in an online search of the Psych-Info database, “multiple intelligences” yielded 72 references, only one of which was an empirical study. Out of 398 citations on multiple intelligences in an ERIC search, less than a dozen were empirical, and none had been published in refereed journals. The few existing studies explored the academic, motivational, and behavioral benefits of MI theory and teaching for students in regular education classrooms, but none were specifically related to either students with developmental disabilities or inclusive classrooms. Similarly, a manual search of Education and Training in Mental Retardation and Developmental Disabilities, the Journal of the Association for Persons with Severe Handicaps, the Developmental Disabilities Bulletin, and the Journal of Special Education from 1990-1999 revealed considerable research, both qualitative and quantitative, on the benefits of inclusion for elementary school-aged children with developmental disabilities, although none was related to the use of MI theory and teaching. Thus, the literature review in this chapter summarizes the research specifically related to the effects of the inclusion of students with developmental disabilities in elementary school classrooms for both students with and without disabilities; however, it
includes the existing research related to MI theory and its benefit for elementary-aged typical
students only, since the literature in this area is relatively limited.

**Educational Benefits of Inclusion**

To educate means “to develop and cultivate” (Merriam-Webster, 1978). To teach, on
the other hand, is defined as “to cause to know; to show how; to guide; to make to know the
consequences of” (Merriam-Webster, 1978). Education, therefore, includes more than
instruction in academic subjects; and teaching includes more than just content delivery.
Education must develop the whole child and cultivate all of the skills, attitudes, and
knowledge necessary for successful integration into society. Schools must provide students
with opportunities to discover, model, experience, and learn consequences. This is true for all
populations of learners, both with and without disabilities; but it is especially true for students
with developmental disabilities, because they often have difficulties with social, emotional,
communication, motoric, and behavioral development, in addition to academic learning (Alper
& Ryndak, 1992). Thus, practices such as inclusion that aim to educate such students in the
full sense of the word must promote their social, emotional, communication, motoric, and
behavioral development, in addition to their academic achievement.

In the first section of this chapter, the term “educational benefits” will be used to refer
to both social and academic outcomes. The first part of this section will review research that
has evaluated the social, emotional, and behavioral benefits of inclusion for students with and
without developmental disabilities. In the next section, research that has examined the
academic outcomes of inclusion for students with and without disabilities will be explored,
including studies that have measured both traditional academic outcomes (e.g. literacy,
mathematics, etc.) and non-academic skill development in areas such as basic life skills (e.g.
communication, motor skills, functional life skills). Teaching techniques and educational contexts that have been found in the research literature to promote effective inclusion (i.e., to provide optimal learning for all students, both with and without disabilities) will then be delineated.

Social Benefits of Inclusion for Students with Developmental Disabilities

The impetus behind inclusion from an educational and research standpoint (as opposed to a moral or political one) came primarily from early research evidence that contact with typical (i.e., nondisabled) peers is likely to increase the social, communication, and behavioral skills of students with developmental disabilities (Cole & Meyer, 1991). For instance, the amount of contact with students without disabilities has been shown to be associated with increases in social skills and reciprocal interactions (Cole & Meyer, 1991), increased achievement of IEP objectives (Brinker & Thorpe, 1984), positive parental expectations and attitudes (Hanline & Halvorsen, 1989), development of friendships and social support networks (Fryxell & Kennedy, 1995), and improved behavioral outcomes (Lee & Odom, 1996) for students with developmental disabilities. Brown et al. (1987, cited in Alper & Ryndak, 1992) reported that increased opportunities to interact with typical peers at school was associated with students spending more of their leisure time outside of the home with their peers after high school graduation. In addition, these graduates had greater success in competitive employment rather than sheltered workshops. As a result of such reports, much of the early research on inclusion sought to examine/confirm the social efficacy of inclusion, rather than its academic efficacy. The prevailing attitude seemed to be that children with developmental disabilities were appropriately integrated for social reasons, not academic ones (Alper & Ryndak, 1992; Schnorr, 1990).
In several qualitative studies that investigated parent, teacher, and student beliefs surrounding inclusion, social goals/outcomes were frequently identified as being of central importance. Baumgart, Filler, and Askvig (1991) surveyed teachers, “experts” (i.e. special education teachers and clinicians), and parents regarding the perceived importance of social skills for students with disabilities. Teachers and experts rated social skills as goals that were “quite important” and “essential.” Parents rated social skills goals as between “somewhat important” and “important.” Thus, although teachers and experts placed more emphasis on social skills than did parents, all agreed that social skills were important for students with disabilities. Further research has supported these findings. For example, Hamre-Nietupski, Nietupski, and Strathe (1992) conducted a survey of parents of children with developmental disabilities. Those whose children had severe disabilities rated friendship and social skills goals as their top priorities. While parents of students with moderate disabilities rated functional life skills as most important, they also agreed that social skills and friendships were highly valued goals for their children.

In a longitudinal case study of Melinda, a girl with a developmental disability who moved from special classes to an inclusive classroom (Ryndak, Morrison, & Sommerstein, 1999), many of the parents’ and the student’s comments were related to social outcomes. For instance, when her parents were asked about her overall experiences in inclusive settings, her mother stated “Inclusion allowed her to have the same experiences as [typical peers]...When we let her out, she had contact with nondisabled students and higher expectations” (p. 13). The student herself presented at a local conference on inclusion, and, when a moderator asked her “What was the difference between the special class and the regular class?” she replied, “When I was in a special class, I used to put my head down on the desk. I used to look out the
door and watch the kids go by, and now they’re my friends” (p. 15). In a letter Melinda wrote to testify on the least restrictive environment debate for the Education Committee of the State Assembly, she referred to being able to learn from watching “what her friends do,” and being “taught by her friends and teaching them, as well,” In her closing statement, she wrote “Please change the laws to help kids like me be in regular classes with their friends” (p. 17).

The opportunity to interact with and learn from peers without disabilities has been shown to correlate with measures of self-esteem, social skills, positive affective and behavioral outcomes, and academic achievement for students with developmental disabilities (Alper & Ryndak, 1992; Brinker & Thorpe, 1984; Hunt, Alwell, Farron-Davis, Goetz, 1996; Lee & Odom, 1996). Thus, the social benefits of inclusion, and the opportunities inclusive classrooms provide for these interactions, include not only direct social skills and outcomes (such as pragmatic language development, a sense of belonging, and friendships), but also more indirect outcomes such as happiness, self-concept development, and positive behavioral change. As a result, some researchers have begun investigating the rate and type of interactions that occur between students with developmental disabilities and their classmates, teachers, and support staff, in order to measure the outcomes of inclusion. In some such studies, the rate and type of interactions (i.e., social versus task) of students with disabilities with their typical classmates has been found to be statistically correlated with behavioral, communication, social skills, and academic achievement (Brinker & Thorpe, 1984; Hunt, Farron-Davis, Beckstead, Curtis, and Goetz, 1994).

Opportunities for social interaction. The claim that inclusive classrooms provide students with developmental disabilities with greater opportunities to interact with peers without disabilities appears to make common sense. However, many self-contained
classrooms also provide structured opportunities to interact with peers without disabilities, and also arrange for partial integration into typical activities/classrooms (Helmstetter, Curry, Brennan, & Sampson-Saul, 1998). On the other hand, it is not uncommon to hear of inclusive classrooms in which students with disabilities are segregated physically, instructionally, and socially. In such classrooms, students with disabilities may follow different schedules, have a separate physical spaces set aside for them, and work mostly 1:1 with teacher's aides or other resource personnel (Downing, Morrison, & Berezin-Rascon, 1996; Schnorr, 1990). Thus, some of the early research on inclusion sought to document the extent to which opportunities for students with developmental disabilities to interact with their typical peers were, indeed, influenced by their class placement.

A Canadian study (Saint-Laurent, Fournier, & Lessard, 1993) compared three programs for students with moderately mental handicaps in this regard. Thirty-three elementary school-aged target students participated. Fifteen students attended special classes using a community-based program, 10 attended traditional/developmental self-contained classes, and eight were included in regular education classrooms. Measures included standardized tests for development, language, academic achievement, and adaptive behavior, as well as academic records, interviews, and questionnaires over a 2-year period. The authors concluded that full integration proved to be advantageous in terms of social behavior. The included students had a significantly greater mean frequency of opportunities to interact with their typical peers. Similarly, Hunt and Farron-Davis (1992) conducted an investigation of IEP quality and content associated with placement in general education versus special education classrooms. They documented increases in quality for all seven "indicators of best practices" in the IEPs written for inclusive placements, with the indicator "opportunity for interaction
with non-disabled peers" reaching significance. Thus, inclusive classrooms in both of these studies were found to provide significantly more opportunities for interaction with typical peers than self-contained classrooms.

Hunt, Farron-Davis et al. (1994) also evaluated the effects of placement of students with severe disabilities in general education versus special classes. Two students with severe disabilities were selected from each of 16 participating classrooms, for a total of 32 participants. The selected classrooms had received considerable previous inservice training on inclusive practices, and were considered to be model programs in this regard. Eight sites reflected a full inclusion philosophy and the remaining eight were special education classrooms within regular education schools. Both types of sites provided for integration with typical students during general school activities (e.g. recess, lunch, assemblies, field trips) and encouraged students with disabilities to participate in both planned and incidental social interactive opportunities. IEP quality, social interactions, educational contexts, and participants’ affective demeanor were measured and compared. A two-way between subjects small group design was used to test the hypothesis of no difference between the two types of sites (full inclusion vs. special education classrooms) with regard to the dependent variables. The results indicated that the fully included students’ IEP objectives placed more emphasis on participation with typical peers than did those of their special education classroom counterparts. In addition, students who were full-time members of general education classes were less often alone and more often with others than were those in special class programs, a surprising finding given the smaller staff-to-student ratios in the special classrooms. There were no differences in affective demeanor variables between the two groups, but there were
significant differences in participants’ social skills and interactions; these will be discussed in the next section on social skills.

**Social interactions and the development of social skills.** The opportunity to interact with students without disabilities does not automatically mean that students with disabilities can or will take advantage of these opportunities. Thus, perhaps of greatest significance in the Hunt, Farron-Davis et al. (1994) study was the finding that the students with severe disabilities in full inclusion classrooms initiated social interactions with others more often than did those in special class programs. Initiations by the fully included students to others were also more social in nature and less task-related. There were more reciprocal interactions for the fully included students with all partners (i.e., nondisabled peers and adults) than for students in segregated settings; yet, there were no differences in the level of initiations by others toward the target students. Thus, the students in inclusive classrooms were not just responding to a greater degree of social activity, but were in fact internalizing and modeling social interactions more often. This supports the contention that placement in inclusive classrooms is likely to encourage the growth of social and communication skills.

In a follow up study, Hunt et al. (1996) investigated the use of a multi-component intervention designed to promote social relationships and friendships for included students with severe disabilities. Three students who experienced severe sensory, physical, and intellectual disabilities and were full-time members of elementary school classrooms were exposed to the intervention. The authors concluded that, while the intervention increased the rate of students’ overall interactions, it did not substantially change the quality of those interactions (i.e. with whom the interactions occurred, their context, and the type of interactions). Thus, the target students’ interactions were still primarily task-related, often
involved paraprofessionals, and were not accompanied by increased positive affect. The question of whether changes in the quantity (i.e., rate) of interactions is an appropriate goal for students with disabilities is still open to debate, and requires comparative research to determine the nature of typical students’ interactions in classroom settings to set a normative pattern.

In 1992, Evans, Salisbury, Palombaro, Berryman, and Hollowood compared the interaction patterns of eight students with developmental disabilities in inclusive classrooms and eight of their classmates without disabilities. Early in the school year, interactions between peers with and without disabilities were less reciprocal than were interactions between two typical peers. Some typical students tended to interact with students with disabilities primarily by helping, showing affection, and engaging in “parenting”-type behaviors. Thus, although interactions took place and were of a positive nature, they were neither initiated nor reciprocated by the students with disabilities. However, the social interaction patterns for students with and without disabilities became more similar as the year progressed. It appeared that the students with disabilities developed social skills over time and this, in turn, allowed them to begin to initiate and reciprocate interactions. Both social competence and level of disability were also investigated to determine whether they played a causal role in the level of student acceptance and social interaction rates. Neither measures of social competence or disability status predicted popularity. Thus, the idea that students with disabilities are automatically at a social disadvantage is called into question by the results of this study. As is the case for typical students, some of the students with disabilities were popular and others were not, and their degree of popularity appeared to be related to intrinsic personality traits rather than to disability or social skills per se.
Downing et al. (1996) undertook a qualitative study that investigated the benefits of transition from a segregated classroom to an inclusive classroom for three elementary school students with autism. Interviews, field notes kept by school staff and classroom observations were all triangulated to determine common themes and outcomes. Improved social communication skills were noted for all three students. One student developed verbal skills, while the others were more responsive nonverbally and showed increased rates of interaction with their typical peers. Over the course of the year, all three students also began to interact with their peers at recess, and to respond to directions given by classmates (e.g. directions to line up).

Cole and Meyer (1991) conducted a longitudinal study to determine whether the social skills development seen in the research had lasting effects. Participants were drawn from five schools, had severe/profound developmental disabilities or multiple handicaps, and ranged in age from 6-21 years. Fifty-five participants attended segregated special education schools, and 36 attended integrated schools. Participants were rated on measures of social competence, intellectual functioning, and student-environment interactions. No differences were detected between the two groups on any demographic or diagnostic criteria at the beginning of the study. Over a 2-year period, significant differences were found for the two groups in the areas of social competence and student-environment interactions. Specifically, students in the integrated sites improved in their ability to manage their behavior in social situations by providing negative feedback to others (e.g. asking to be left alone, refusing assistance, etc.), accepting assistance, indicating personal preferences, coping with negative social circumstances, and terminating social contact. Conversely, students in the segregated sites actually regressed in each of these skill domains, perhaps reflecting the development of
learned helplessness, or of the growing gap between their skills and chronological ages. In addition, students in the integrated sites spent more time with their classmates and less time alone than did those in the segregated sites, a finding later replicated in the Hunt, Farron-Davis et al. (1994) study.

**Social interactions and behavioral outcomes.** The opportunity to interact socially with students without disabilities has also been associated with positive behavioral outcomes for students with developmental disabilities (Downing et al., 1996; Lee & Odom, 1996). This may occur because in inclusive settings, students with disabilities have increased opportunities to imitate socially acceptable, age-appropriate behaviors (Saint-Laurent et al., 1993). In addition, social interactions may provide stimulation and attention-focussing stimuli that lessen inappropriate behaviors and increase positive behaviors such as those related to play. Through modeling, students with developmental disabilities appear to learn behaviors that are essential to successful integration in school and community, including: (a) following rules, (b) waiting their turn, and (c) problem-solving in social situations, among others (Alper & Ryndak, 1992). Although opportunities for modeling may also be encountered in segregated settings, they are likely to be contextually different than those found inclusive settings, and appropriate peer models are not available. This is essential because many students with developmental disabilities have difficulties with generalization of skills across settings (Alper & Ryndak, 1992; Cole & Meyer, 1991). Thus, social skills that are acquired in segregated settings may not generalize readily to integrated home, school, and community settings.

An example of this phenomenon was reported in the case study by Downing et al. (1996) that was described previously. All three students with autism in this study had extremely challenging behaviors when they were in the segregated classroom, including...
screaming, biting, throwing things, hitting, kicking, spreading feces, and so forth. Both the frequency and duration of challenging behaviors decreased for all three students when they were transitioned to an inclusive classroom. For two of the students, challenging behaviors had almost ceased by the end of the school year. For the third student, the rate had decreased considerably, although some incidents still occurred. Interestingly, this latter student was the most isolated of the three; he was seated separately from the rest of the class, interacted very little with his classmates and general education teacher, and spent most of his time on a completely modified 1:1 program with his aide. Given that all three students received the same type of behavioural treatment (i.e., a functional assessment of behavior and related interventions), it is interesting to note that the student who was the least “included” in the activities and interactions of the classroom also made the least progress.

In 1986, Lord and Hopkins also studied the social interactions of children with autism. Six elementary school students from 8-12 years old were observed for their social play and behavior. Proximity to and the opportunity to play with both same-aged and younger peers increased the social interactions of the students and decreased their stereotypic behaviors. In a follow-up study specifically designed to explore the relationship between social interactions and stereotypic behaviors, Lee and Odom (1996) observed two students with autism in inclusive elementary school classrooms. An intervention designed to increase the social interactions of typical peers with the target students was implemented. The results indicated an inverse relationship between peer social engagement and stereotypic behavior for both students with autism. The authors hypothesized that increased social engagement created a more stimulating environment for the students and that, when provided with the option, the
students with autism chose to engage in social interactions and play rather than stereotypic behavior.

Saint-Laurent et al. (1993), in the study that compared programs for students with moderate mental handicaps, found that students in inclusive classrooms attended more and were less disruptive than were students in segregated classrooms. The included students also had significantly higher mean scores for responsibility, and were more independent and self-sufficient. The authors concluded that full inclusion proved to be advantageous in terms of social behavior. The regular class “seemed to provide handicapped students with more models of adequate social behavior than would a self-contained classroom in an integrated school” (Saint-Laurent et al., 1993, p. 343).

In the case study discussed earlier of Melinda (Ryndak et al., 1999), significant behavioral changes were also noted, even during the time of partial transition from a self-contained to an inclusive classroom. Prior to her movement to the inclusive classroom, Melinda’s parents had become increasingly concerned about her behaviour, and noted that “Her behavior was deteriorating . . . She was becoming very obnoxious in class” (p. 7). Her parents felt that behavioral goals should become a priority for her program: “What difference does it make how many facts she knows? . . . Let’s get her acting appropriately and not kicking people, just so she can hold down a job” (p. 7).

As her transition to the inclusive classroom began, dramatic changes in Melinda’s behavior were noted almost immediately. In the segregated classroom, Melinda was consistently off-task and refused to do independent seatwork. When asked to do academic tasks, she either avoided doing so by changing the topic or responded with acting-out behaviors such as yelling, pushing materials away, or physically removing herself. She would
periodically "fall apart," yelling at people and refusing to co-operate in any way; or she would completely "shut down." In addition, she frequently spoke loudly and at inappropriate times in the self-contained classroom. In the inclusive classroom, few of these behaviors were apparent. Melinda was consistently on task and attempted to do everything her peers without disabilities did. She developed behaviors that demonstrated a heightened awareness of the appropriateness of her behavior and of her peers' reactions to her, such as learning to say, "give me a minute" when she felt frustrated or overwhelmed. She did not call out or raise her voice, but instead attended to the teachers and silently followed directions. While some of these behaviors may have developed due to maturity, Melinda consistently displayed markedly different behavior in the self-contained classroom as compared to the inclusive classroom, even during the transition year when she spent part of her day in each setting. Thus, maturity alone could not account for the changes that were seen in her behavior. It appeared that the modeling of her classmates without disabilities, the increased expectations, and the educational opportunities available in the inclusive classroom affected Melinda's behavior in positive ways.

Happiness behaviors are often considered to be indicators of positive affect and quality of life (Felce & Perry, 1995; Logan et al., 1998). Happiness behaviors may include (but are not limited to): smiling, laughing, eye contact, alertness, and changes in body tone that reflect relaxation or anticipation of pleasurable interactions (Felce & Perry, 1995; Logan et al., 1998). In the Ryndak et al. (1999) report, Melinda began to exhibit increased happiness behaviors in the inclusive classroom. She spent less time with her head on her desk and appeared more alert. Her father described her as "Having a different attitude. She was happier, friendlier" (p. 18). Similarly, Logan et al. (1998) explored the impact of peer relationships on
the perceived happiness of five students with profound developmental disabilities. An alternating treatments design was used to compare the occurrence of the target students' happiness behaviors during a small-group activity with typical peers and with peers with disabilities. All five students showed a higher percentage of intervals of happiness behavior during the typical peers condition. These increases ranged from 2-8 times more happiness behaviors per student, with the exception of one student who displayed a very high rate of such behaviors to begin with. The data showed that peers with disabilities interacted very little with each other, while the typical peers provided high levels of verbal and physical interactions. The authors postulated that there were qualitative differences in the types of interactions provided by typical peers, and that it was the nature of these interactions, not just their rate, that positively affected the happiness of the students with disabilities. However, specific research into the nature of these qualitative differences is required to validate this hypothesis.

**Social interactions and the development of friendships.** There is ample evidence for the positive effects that result from participating in social relationships and friendships, having a sense of belonging, and participating in social support networks (Fryxell & Kennedy, 1995; Hall, 1994; Williams & Downing, 1998). Social relationships provide companionship and models for communication and behavior, reduce stress through supportive communications or actions, and develop a positive self-concept through feedback and reciprocal interactions. Achieving a sense of belonging is fundamental to children’s psychological well-being (Salisbury, Gallucci, Palombaro, & Peck, 1995; Strully & Strully, 1985). Students who do not have a sense of belonging have been shown to be at risk for loneliness, peer rejection, isolation, and powerlessness (Williams & Downing, 1998). The opportunity for students with
disabilities to interact and form friendships with students without disabilities is therefore a goal in and of itself, and one that should not be minimized or overlooked (Alper & Ryndak, 1992; Schnorr, 1990).

Inclusive classrooms appear to maximize the opportunity for students with developmental disabilities to meet and form friendships with students without disabilities by increasing the opportunities for them to interact (Alper & Ryndak, 1992), developing their social skills (Evans et al., 1992), making mutually reinforcing events accessible (Haring & Breen, 1992), and arranging for activities that require cooperation (Fryxell & Kennedy, 1995; Janney & Snell, 1996; Strain, Odom, & McConnell, 1984). For example, Fryxell and Kennedy (1995) explored the effects of placement in general education or self-contained classrooms on the social relationships of 18 students with severe disabilities. Nine students were members of general education classrooms and nine were members of special class programs that were identified by local administrators as providing high-quality services within that placement model. Students in the two groups were matched for age, gender, level of disability, and adaptive social and communication behavior. A post-test only control group design with matched comparisons was used to identify differences between the two groups of students. Results from observations indicated that students placed in general education classrooms had higher levels of social contact with schoolmates without disabilities, and engaged in a greater number of activities in more settings. Students with severe disabilities in inclusive classrooms received and provided higher levels of social support, and had much larger friendship networks, composed primarily of schoolmates without disabilities, than did their segregated peers.
Cole, Vandercook, and Rynders (1988) conducted a study to investigate the contexts in which students with disabilities developed friendships with students without disabilities. They observed 53 dyads consisting of one student with developmental disabilities and one student without disabilities in two programs, a highly structured peer tutoring program and a special friends program. They found that the interactions of the students within the dyads reflected the purposes of the respective programs. For example, in the dyads involved in peer tutoring programs, the typical student adopted a "helper" attitude and there was little reciprocal interaction. In the dyads involved in the special friends program, however, the two students usually played with and watched each other at nearly equal rates, and both members demonstrated high degrees of positive affect. Thus, inclusive classrooms, by providing students with disabilities the opportunity to interact with students without disabilities in less structured, social settings (such as recess, lunch, etc.) may facilitate reciprocal interactions and opportunities for friendship development.

Qualitative studies have also provided support for the finding that opportunities to interact with typical peers in social settings promotes the development of friendships between students with and without developmental disabilities. This is not to say that teacher interventions, educational contexts, or social and communication skills training will not enhance these opportunities, but rather that these friendships appear to be able to develop without these external supports. In one such study (Grenot-Scheyer, 1994), researchers observed the social interactions in 20 dyads of elementary-aged students consisting of one student with and one student without a developmental disability. Students in the former group were all considered to be severely disabled, and were assessed using standardized tests for developmental level, receptive and expressive language ability, and social competence. The
author found that students with developmental disabilities who had friends did not differ in terms of any of these measures from those who had only acquaintances. The author suggested that inherent personality characteristics such as being “engaging,” rather than disability status, marked the difference between the groups. For that reason, she recommended that opportunities for inclusion and interaction with peers without disabilities should be made available to all students with severe disabilities, not just those who already demonstrate specific “prerequisite” social skills.

Hall (1994) assessed the social relationships of four students with developmental disabilities in four different elementary school inclusive classrooms. Observational recordings during free play, peer nominations, and teacher and peer interviews were all used as measures. Reciprocal, positive relationships were found between children with developmental disabilities and their classmates without disabilities in all four classrooms. Interestingly, teachers did not use the word “friends” when describing the interactions in interviews; instead, they described helping and empathic behaviors. However, the students without disabilities did identify their peers with disabilities as friends, and described reciprocal relationships in this regard (e.g., “He is a nice friend and he plays with me a lot”; “He is a good friend, he’s kind and one of the best people I like”, p. 310). The students with disabilities were found to range in social status, as did their friends (i.e. some were of high social status/popular, while others were not). Significantly, high social status was not related to either level of disability or expressive language skills. The author concluded that friendships between students with and without developmental disabilities can occur without formal teacher or aide interventions, as none existed in any of the four classrooms observed.
In the study of three children with autism discussed earlier (Downing et al., 1996), friendships developed for all three students within their classrooms. A circle of friends was started for one student, and his mother reported that after a phone call from a peer without disabilities, the target student reported that he (the caller), was "his best friend" (p. 37). At the end of the school year, half of the classmates without disabilities interviewed reported that the student with autism in their classroom had made friends.

Staub, Schwartz, Gallucci, and Peck (1994) conducted a qualitative case study of four friendships between elementary school students with moderate to severe developmental disabilities and classmates without disabilities in inclusive schools. Teachers nominated peers as "friends" of the students with developmental disabilities, and these friendships were confirmed through classroom observations, videotapes, and interviews. Benefits for the students with developmental disabilities, as reported by their friends, classmates, parents, teachers, and the students themselves, included companionship, appropriate social and behavioral models, and academic assistance. All four friendships developed in social (i.e. non-academic) contexts. This is a significant finding because such relationships are often perceived as unidimensional and as placing excessive demands on students without disabilities. However, in this study, the friendships appeared to be genuine social exchanges that were valuable for both participants. The benefits of such friendships for students without disabilities will be discussed in a later section.

It appears that peer relations are influenced by a number of characteristics beyond those directly associated with disability (Evans et al., 1992; Grenot-Scheyer, 1994; Hall, 1994). Social and cultural experiences of the classmates without disabilities, the personalities of both partners in the friendships, activity preferences, ongoing opportunities to spend time
together, and strategies used by teachers to promote positive attitudes and classroom climate may all be mediating factors (Janney & Snell, 1996; Schnorr, 1990). In one of the first studies to explore the attitudes of students without disabilities towards integration, friendship, and what makes someone “belong,” Schnorr (1990) observed a grade one classroom in which a student with a moderate developmental disability, “Peter,” was integrated part time. She found that the grade one students defined “belonging” in terms of their peers’ grade assignments, teachers, and participation in the classroom. Friends and relationships were based on “with whom one played,” and often were associated with current classmates only. Thus, students who had been friends the previous year but who were now assigned to different classes were no longer considered friends. Thus, proximity and the opportunity to interact within the classroom appeared to play a role in determining friendships. These factors played a significant role in the students’ attitudes toward Peter, because he was rarely in class and thus was not considered by them to be a member of the class: “He comes here in the morning. He’s not in our class. He doesn’t ever stay...He leaves to go back to his room” (p. 235). They concluded that “where Peter belongs” is where he spent the majority of his time -- namely, in his segregated classroom.

The students in this grade one were also influenced by teacher attitudes. They were aware of “who got hollered at” and who was “good.” Students also noted the activities in which they engaged that Peter did not. They commented that he “just plays” and that he didn’t “come during work-time” (p. 237). The students did not see Peter as a friend or as belonging to their class, not because of any personal or disability characteristics, but because he was simply not included in the life of their classroom. He was not there for critical social activities,
did not participate in the same tasks/assignments, did not follow the same daily schedule, used different materials and teaching methods, and was taught by different personnel.

In a later study that used focus group interviews of middle school students, Williams and Downing (1998) found similar themes with regard to how "belonging" was defined. Fifty-one students, four of whom had severe disabilities, participated in the interviews. The students felt that membership was associated with “having a place” in the class, feeling welcome, and feeling wanted and respected by classmates and teachers. Students who were active, participated in class activities, and tried hard were considered to be members of the class. To be a part of the class, students had to know the routines of the class, some of the members of the class, and the teacher. In general, the students without disabilities considered their classmates with disabilities to be their friends and to be members of the class. One student was discussed as being a member of the class because she “does what everyone else does, basically. She goofs around and is open-minded” (p. 106). Teachers who treated all students equally and had expectations for all were perceived as promoting membership for the students with disabilities. Calling on everyone, having clear behavioral expectations, and providing similar tasks/materials were all seen as facilitating membership for the students with disabilities. The students with disabilities reported that they felt like they were members of the class “because I am in the class everyday and I do the same work…and I answer questions and I guess that means I am part of the class” (p. 103).

In summary, although most of the studies investigating the social benefits of inclusion for students with developmental disabilities have limited external validity due to their small sample sizes, the aggregation of their findings supports the contention that inclusive classrooms provide students with developmental disabilities substantial opportunities for
interaction with typical peers. These opportunities for social interactions in turn, appear to result in increased development of social and communication skills, friendships, and support networks; a sense of belonging; and positive behavioral outcomes.

Social Benefits of Inclusion for Typical Students

Inclusive classrooms offer many social benefits for students without disabilities as well. They may have opportunities to learn many new skills, values, and attitudes related to human differences (Alper & Ryndak, 1992; Karagiannis, Stainback, & Stainback, 1996). The concept that all people have strengths and weaknesses, can both teach and learn, and have value may increase students’ acceptance of their own abilities and difficulties, and increase their tolerance of diversity. Students may learn how to be friends with people who are different from themselves (Downing et al., 1996; Janzen, Wilgosh, & McDonald, 1995). Effects on students' social skills have been found to include improved attitudes towards peers with disabilities; more sophisticated and improved interpersonal skills in social interactions with a diverse population; and increases in intrapersonal skills such as maturity, self-confidence, and self-esteem (Kishi & Meyer, 1994; Peltier, 1997).

In the case study of the four friendships between students with developmental disabilities and a classmate without disabilities (Staub et al., 1994), many individualized benefits were identified for the students without disabilities. Students without disabilities were said to benefit from companionship and to experience increased social status because they were seen by classmates, teachers, and parents as kind and caring persons. Students who were not leaders within their classrooms benefited from opportunities to be seen as leaders, and by having students with disabilities “look up to them.” Students increased their tolerance/patience and developed better communication/teaching skills, which may have improved their ability to
express or explain their ideas. The trusting, caring, and supportive relationships were bi-directional, and students without disabilities who were shy, quiet individuals appeared to find security in the companionship of their friendships with classmates who were disabled. When asked to describe these friendships, students did not identify them as different from typical friendships. Rather, they talked about the fun they and their friends with disabilities had together, and made statements like "He's cool" (p. 319) and "She's nice, funny" (p. 321). The authors concluded that, if friendship is defined as having three essential components -- enjoying each other's company, being useful to each other, and sharing a common commitment to the good -- then all four relationships met the criteria of "true friends."

In a longitudinal study that also explored the self-reports of students without disabilities (Kishi & Meyer, 1994), many similar benefits were mentioned. Two self-report measures were administered to 183 typical high school students who either had had regular social contact with at least one peer with a disability, had occasional exposure to such peers, or had no contact with such peers in elementary school. A subsample of 93 students was then interviewed about their experiences and attitudes toward people with developmental disabilities in general. Results revealed significantly more positive attitudes (including a greater willingness to have persons with disabilities as neighbors, friends, and co-workers), higher levels of current social contact, and more support for full community participation as a function of early social contact with peers with disabilities. Significantly, there was a strong effect related to self-concept for the social contact group, such that contact with and exposure to peers with developmental disabilities was associated with higher self-acceptance in boys. In addition, the contact group scored significantly higher in self-security and self-assertion than did the control group. The authors concluded that social interactions with peers with
developmental disabilities contributed positively to the self-concept of typical peers by “building upon boys’ abilities to be nurturant and providing girls with opportunities to be valued and noticed” (p. 286). Interviews revealed that most students had positive attitudes towards persons with disabilities, saw them as more like them than different, and enjoyed their experiences with social contact.

**Academic Benefits of Inclusion**

Relative to the number of studies conducted on the social efficacy of inclusion, few studies have investigated the academic benefits of membership in inclusive classrooms for students with and without developmental disabilities. Perhaps this lack of research is due to the origins of the inclusion movement in moral, legal, and social philosophies, rather than educational concerns (Hunt & Goetz, 1997). On the other hand, at the time that inclusion was first proposed, no empirical research existed to support the practice of providing educational services for students with developmental disabilities in settings that separated them from their peers without disabilities and/or educated them in contexts that did not reflect natural settings either (Alper & Ryndak, 1992). Segregated educational placement had been perpetuated by the belief that only some individuals could learn and that specialized, separate, settings were required to educate students with learning differences (Alper & Ryndak, 1992). Karagiannis et al. (1996) noted that “Segregated classes foster[ed] an unrealistic sense of insulation... they alienate[d] students...and students without disabilities ultimately experience[d] an education that places[d] little value on diversity, cooperation, and respect for others who are different” (p. 6). The following section reviews research regarding the academic benefits of inclusion, including both the development of basic life skills (e.g. communication, motor, and self-help skills) and more traditional academic outcomes (e.g. literacy).
Social interactions and academic outcomes. In the course of exploring the social benefits of inclusion, researchers discovered that the opportunity to interact with peers without disabilities also had academic benefits. Brinker and Thorpe (1984) wrote a seminal article exploring the rate of peer interactions as a predictor of inclusion outcomes. They observed the rates of interaction with typical peers by 245 students with severe disabilities in integrated settings, and conducted a multiple linear regression analysis to predict the proportion of IEP objectives (both social and academic) they would achieve. When level of functioning was held constant, the rate of interaction with typical students accounted for a statistically significant 2.1% of the variance. However, the rate of interaction with other students with severe disabilities was not a significant predictor of students' achievement. This is an important finding since it establishes a clear relationship between social interactions with typical peers and the achievement of IEP goals by students with severe disabilities.

Hunt, Staub, Alwell, and Goetz (1994) investigated the academic achievement of students with multiple, severe disabilities in the context of cooperative learning groups in inclusive classrooms. Using an ABAB design, they demonstrated that students with disabilities could acquire basic communication and motor skills through interactions with peers without disabilities who provided them with cues, prompts, and consequences. In the final days of the study, each of the students with severe disabilities was able to produce independent, targeted communication and motor responses. Furthermore, they generalized those skills during follow-up sessions to activities with other members of a newly formed cooperative learning group. The authors concluded that opportunities to interact with peers without disabilities provided the support and motivation that was required to allow the students with multiple disabilities to acquire basic communication and motor objectives. From these two studies, it
appears that opportunities to interact with peers without disabilities in the inclusive classrooms may affect the academic outcomes for students with developmental disabilities.

Class placement and educational outcomes. Meta-analyses and comparative studies that have compared the educational outcomes of students with developmental disabilities in inclusive versus segregated classrooms have found either no difference in educational outcomes or positive effects for inclusion (Alper & Ryndak, 1992; Hunt & Goetz, 1997). For example, Cole and Meyer (1991), in their longitudinal study that explored the benefits of inclusion for students with severe disabilities, found no significant differences over a 2 year period in the traditional domains of self-help skills, gross and fine motor co-ordination, communication, and adaptive behavior for students in integrated versus segregated settings. However, students in the integrated settings spent less time in their school buildings and more time in the community than did their segregated counterparts. This is a surprising finding given the common belief that specialized settings are better able to promote instruction in life skills/vocational/work settings in the community (Cole & Meyer, 1991). Also of significance was the finding that the students in integrated settings spent as much time in contact with special education teachers as did those in segregated settings. Thus, the claim that segregated settings provide more intensive and direct instruction is called into question. In a similar comparison, Saint-Laurent et al. (1993) found no significant academic outcomes for students with moderate developmental disabilities in inclusive, community based, or traditional segregated classrooms. The authors concluded that full integration proved to be advantageous for social and behavioral outcomes, and that it provided academic, functional, and basic skills instruction that was equal to that provided in more segregated settings.
Most of the research studies that have studied the relationship between class placement and educational outcomes have found positive effects for inclusion. In 1985-86, Wang and Baker conducted a meta-analysis to review and analyze the design features and efficacy of mainstreaming as an educational approach to serving students with disabilities. Research articles published from 1975-1984 that focused on student outcomes of mainstreaming were collected through ERIC searches. Eleven studies with sufficient data for quantitative synthesis were identified, for a total sample size of 541 students who were highly diverse in terms of socioeconomic status, sex, race, and geographic location. Over 50% of the students were classified as mentally retarded, 25% included mixed categories of exceptionalities, 19% were hearing impaired, and 3% were learning disabled. The findings suggested that students with disabilities in mainstreamed classrooms made greater overall academic gains than did their peers with similar disabilities in segregated classrooms. The overall mean weighted effect size across all studies and all three categories of outcome measures (i.e., performance effects, attitudinal effects, and process effects) was .33, and the corresponding percentile rank was 63. A series of ANOVA's were performed to investigate the extent to which any single independent variable or cluster of independent variables contributed significantly to the mean weighted effect sizes. The results indicated that none of the independent variables (e.g., type of handicap, grade level, etc.) either singly or in clusters showed a statistically significant impact on the overall weighted effect sizes. This suggests that the positive effect of mainstreaming on student outcomes was unlikely to be the result of any variable other than mainstreaming. Wang and Baker concluded that the results provided support for the effectiveness of mainstreaming in improving performance, attitudinal, and process outcomes students with disabilities.
In 1994-95, Baker et al. reviewed three meta-analyses that had addressed the issue of the most effective setting for the education of special needs students. The effect sizes in all three had demonstrated a small-to-moderate positive effect for inclusive placement, ranging from .08 to .44. This is a significant finding, in that none of the meta-analyses found any negative social or learning effects for inclusion. The authors attempted to discern whether other factors besides class placement influenced the effect sizes (e.g. age, gender, or level of disability), but found no consistent pattern. The authors concluded that “the average of the inclusion effects, 0.195, is near the average effect for effective instructional practice” (Baker et al., 1994-95, p. 34). Thus, inclusion in and of itself could be considered an effective instructional practice.

Helmstetter et al. (1998) compared the use of instructional time for students with developmental disabilities in general and special education classrooms. Nine elementary school students (K-4) with severe/profound developmental disabilities from seven different schools participated. All of the students spent some time in inclusive classrooms and some time in segregated classrooms. The percentage of non-instructional time was significantly different in the two settings, with 58% in the segregated classrooms and only 35% in inclusive classrooms. In fact, even when whole class instruction was deleted from the computation of instructional time, a significantly greater amount of time was devoted to instruction in the inclusive classrooms. This may explain why, despite smaller staff-to-student ratios in segregated classrooms, several studies have documented that students are more often alone, and less often engaged, in self-contained classrooms (Hunt, Farron-Davis, et al., 1994). In addition, the inclusive classrooms focused instruction to a significant extent on academics (72% of the time) as compared to the segregated settings (24% of the time). More instruction
was provided by paraprofessionals and other adults in the segregated setting than in the inclusive classrooms (43% to 21% respectively); conversely, peer-peer instruction was more common in inclusive (18%) than in segregated settings (< 1%). Considering the extensive findings related to the relationship of peer interactions and academic activity to increased engaged behavior (Hunt, Farron-Davis et al., 1994; Logan, Bakeman, & Keefe, 1997) these are significant findings and provide important information regarding the specific opportunities inclusive classrooms offer students with developmental disabilities.

Downing et al. (1996) found that academic progress was made by all three students with autism in the transition study cited previously. All three learned academic skills such as letter identification, beginning reading skills, emergent writing skills, matching, tracing, counting, etc. At the end of the year, one student who had previously not communicated either verbally or in writing, wrote “I learned to write. I walk to school. I don’t hit, bite, or scratch. I’m proud of the classroom teacher. I’m proud of Wood school. I’m proud of my mom. I’m proud of me” (p. 27). In the case of Melinda (Ryndak et al., 1999), her literacy skills developed well beyond expectations in the inclusive classroom. At age 15, Melinda was described as the lowest functioning student in her special education classrooms. In this classroom, Melinda’s instruction focused on basic reading, writing, and math. Melinda had developed “an aversion to reading” (p. 11) and read at a beginning grade two level. After being included, Melinda demonstrated tremendous growth in oral language, reading, and written literacy. This growth was so striking that she was invited to speak to the House Committee on the Least Restrictive Environment, and was able to attend college on a modified program after graduation. She read college textbooks written at a grade seven level or above with complete comprehension. As Melinda reached adulthood, her mother stated:
I attribute the growth to higher expectation on the part of everybody... people expected her to be retarded and then they gave her activities that they would expect retarded people to do. Those tests and statistics really are not a good forecaster of what any child can do, if given the proper opportunities, role models, and settings. (p. 19)

Hunt and Farron-Davis (1992) conducted a preliminary investigation of IEP quality and content associated with placement in general education versus special education classes. They used a nationwide search to locate special education teachers who currently provided support to students with severe disabilities as members of general education classrooms, and who had previously taught the same students in special class programs. Eleven teachers who supported 22 students with severe disabilities were identified. An IEP evaluation instrument was used to compare the IEPs of the students from both types of settings. Measures included quality indicators of age appropriateness, functionality of the skills taught, and the extent to which the design of instructional activities promoted the generalization of the skills to multiple, natural settings. No differences were found regarding curriculum content, and basic skills instruction was targeted equally in inclusion and in self-contained classrooms. The results did reveal a significant increase in the overall quality of the IEP objectives that were written for the focus students when their placements were changed from special classes to full-time membership in a general education classrooms. It appears that the teachers who wrote to the IEPs raised their expectations and used more effective teaching strategies with students in inclusive classrooms. In a related study, Hunt, Farron-Davis et al. (1994) compared the IEP objectives for students with disabilities in general and special education settings. The IEPs for students with less disability in general education classrooms included
significantly more instruction in basic skills (i.e., communication, social, sensory motor, and academic skills) than did those for students in special class programs. This is a striking finding given the common belief that basic skills are more often and more appropriately taught in special education settings. On the other hand, the students with severe disabilities were engaged in more academic activities and fewer basic skills activities in general education settings. This may have been due to a greater emphasis on academic instruction and a decreased emphasis on life skills within the general education classrooms, a finding contrary to Hunt and Farron-Davis' earlier study (1992). The change in outcomes perhaps reflects the development of inclusive practices and goals in the early 1990's, and a balancing of the curriculum relative to students' level of disability. These findings provide support for the contention that basic skills instruction can be addressed within general education classrooms for students who require it.

Engaged behavior and educational outcomes. Engaged behavior (i.e., active involvement in learning and time on task) is a measure that has been shown to predict academic achievement (Bulgren & Carta, 1993; Greenwood, Carta, Kamps, & Arreaga-Mayer, 1990). In fact, previous research has suggested that the engaged behavior of students with disabilities is the single best predictor of academic gains (Bulgren & Carta, 1993; Kamps et al., 1991; Sindelar et al., 1989). Thus, if general education classrooms promote the active engagement of students with disabilities, it would be expected that academic achievement would also be improved.

In the Hunt, Farron-Davis et al. (1994) study, measures of the rate and type (i.e. active versus passive) of engagement were recorded. Results indicated that the students with developmental disabilities in inclusive classrooms demonstrated higher levels of engaged
behavior than did those in self-contained classrooms. These findings correspond with the finding that these students were less often alone and were most often with at least one other student, since one would expect the level of engagement to parallel that of proximity. In addition, students with more disability in this study were more actively engaged in inclusive classrooms than were their peers in segregated classrooms.

Logan and Malone (1998) examined the instructional contexts provided for students with moderate, severe, and profound developmental disabilities in general education classrooms and their effect on engaged behavior. Twenty-nine students (K-3) participated over a three-year period. Students of all disability levels spent a significantly greater amount of time engaged in academic activities than in any other activities. They were involved in more whole-class activities than in small group or individual structures, and were taught most often by general education teachers. The students' level of disability had some effect on their engaged behavior, although all students demonstrated a high rate of engagement in academic activities. The students' level of participation in functional skills training was limited; however, most of the data were not collected during the non-instructional times when functional skills instruction was most likely to have occurred.

The three autistic students in the Downing et al. study (1996) all increased their level of participation and time on-task from the beginning of the year to the end. They were also found to spend more time with the class doing the same activities rather than parallel or separate activities. This is a significant outcome, as students' sense of belonging, self-esteem, and engagement are all affected by participating in the "regular" activities of the classroom alongside their peers (Schnorr, 1990; Williams & Downing, 1998).
Hollowood, Salisbury, Rainforth, and Palombaro (1994) investigated the amount of time allocated for instruction, the actual used time for instruction, and students' engaged time in inclusive classrooms. Students with severe disabilities had more of their daily schedule allocated to instructional tasks than did students without disabilities. Both groups spent comparable proportions of time passively engaged in instruction; however, students with disabilities spent less of their school day actively engaged than did students without disabilities. The authors suggested that this might have been due to the presence of instructional aides for the students with disabilities, who provided extended instruction that often relegated the students to passive roles.

Helmstetter et al. (1998) also assessed the engaged behavior of their students with severe disabilities in integrated versus segregated classrooms. All of the students spent some time in each of the two settings and spent less time engaged in non-instructional activities when they were in the inclusive classrooms. Active engagement was most prevalent when the students worked in 1:1 formats, regardless of the setting. However, because more individual work was done in special education classrooms, and more whole-group instruction was provided in general education classrooms, active engagement was higher in the special classrooms. The authors noted these results are not surprising, given that passive engagement (i.e., where students listen while the teacher talks) is often the norm in the whole-class instructional activities frequently encountered in general education classrooms.

Altman and Kanagawa (1994) also raised the issue of the need to explore specific instructional contexts and variables that promote the engaged behavior of students with developmental disabilities. They observed three students with mild developmental disabilities who spent half of their days in integrated kindergartens and half of their days in specialized
programs. They found considerable individual social and academic variation in engaged behavior across the three students. However, they concluded that the opportunity to engage in academic and social activities varied according to the degree to which potential social agents, and presumably academic ones as well, were available and responsive in the environments. Inclusive classrooms provide a greater number of social agents and more responsive peers, and should therefore promote the engagement of students with disabilities to a greater degree than self-contained classrooms in which all of the students have social, communication, and learning difficulties. In fact, the bulk of the research has shown that students with disabilities are more engaged in academic activities in inclusive classrooms than in segregated classrooms (Hunt, Farron-Davis et al., 1994; Logan et al., 1997).

**Academic benefits of inclusion for students without disabilities.** Concerns have often been raised in the inclusion literature about the impact of the presence of students with developmental disabilities, particularly those with challenging behaviors, on the learning of typical students (Kauffman, 1993; Peltier, 1997; Staub & Peck, 1995). Hollowood et al. (1994) investigated the degree to which the presence of students with severe disabilities in inclusive classrooms affected the time allocated for instruction, the actual time used for instruction, and students' engaged time. Classrooms with and without students with severe disabilities were compared on all three variables. The average time allocated and used for instruction was comparable for both types of classrooms. There were no differences in the percentage of time typical students were engaged in instruction across the two classroom types. This was a significant finding, as it demonstrated that the presence of students with severe disabilities, even those with challenging behaviors, did not negatively impact the
amount of engaged time for typical learners. This finding has since been replicated in other studies (Peltier, 1997; Staub & Peck, 1995).

Hunt, Staub et al. (1994) assessed the achievement of students with and without disabilities in the context of co-operative mathematics learning groups in inclusive classrooms. Typical students were taught to prompt, cue, and facilitate specific communication and motor skills for students with severe disabilities in co-operative group activities. The results indicated that the peer-facilitated interactions did not negatively affect the peers’ achievement of academic objectives. Students without disabilities in the experimental co-operative learning groups performed equally as well as their peers in co-operative groups that did not include a student with a disability.

In the four portraits of friendship article (Staub et al., 1994), several observations were made regarding academic outcomes for students without disabilities. A grade one student who acted as a peer tutor for a student with a disability, after hearing about a science fair called the “Invent America Contest,” came home and announced that she wanted to enter with a wheelchair swing. She proceeded to build the swing and enter it in the contest, undoubtedly learning a great deal about mechanics, engineering, and other scientific concepts along the way. Thus, her friendship with a peer with disabilities appeared to provide motivational and conceptual knowledge to which she would not have been exposed otherwise. It has been well documented in the literature that students who act as peer tutors in academic areas learn the related academic content to a greater degree/depth than those who have passively listened to or read the material (Fisher, Schumaker, & Deshler, 1995).

From this review, there is little doubt that research over the past 20 years has identified many social and academic advantages of inclusion for students both with and
without disabilities. At this time, therefore, it seems that Baker et al. (1994-95) were prophetic in saying:

As schools are increasingly challenged to serve a diverse student population, therefore, the concern is no longer whether to provide inclusive education, but how to implement inclusive education in ways that are both feasible and effective in ensuring schooling success for all children (p. 34).

**Instructional Contexts and Teaching Techniques That Promote Academic Achievement in Inclusive Classrooms.**

Recognition that inclusion benefits both learners with and without disabilities has led to a body of research which has sought to more clearly define the necessary contexts, techniques, and curricular reforms that support the learning of all students. The most commonly mentioned adaptations in this literature include the use of programs to increase social interactions between students with and without disabilities, flexible groupings, cooperative learning and peer tutoring, choice-making opportunities, multi-modality instruction and flexible response activities, curriculum/performance based assessment, and collaborative teaching. The use of technology, and community involvement have also been shown to improve the efficacy of inclusion for all students.

**Social network supports.** Students with disabilities have benefited from structured programs designed to develop social support networks for them in the inclusive classrooms (Janney & Snell, 1996; Salisbury et al., 1995). These programs have been designed to increase interactions; develop social skills; and provide peers without disabilities with information about, and techniques for interacting with, students with disabilities. For instance, Hunt et al. (1996) demonstrated the utility of such an intervention program for three students with
multiple disabilities. All three target students increased their rate of reciprocal interactions and initiated more interactions with peers without disabilities after the program was implemented. Similar programs such as special friends and buddy systems have also been shown to facilitate the social inclusion of students with developmental disabilities (Kishi & Meyer, 1994; Wisniewski & Alper, 1994).

**Instructional arrangements.** Logan et al. (1997) investigated the effects of interactional and contextual variables on students' academic achievement. They collected observational data on 29 students with severe disabilities. The results indicated that 1:1 and small-group instructional arrangements resulted in higher levels of engaged behavior than whole-class arrangements. In addition, the researchers noted that engaged behavior was greatest when peers acted as tutors of students with disabilities. In fact, the use of small group and 1:1 instruction (including peer tutoring or partner work), as opposed to whole-class or independent seatwork, has repeatedly been shown to result in superior levels of engagement and achievement for students both with and without disabilities (Altman & Kanagawa, 1994; Helmstetter et al., 1998; Muyskens & Ysseldyke, 1998). For example, in a study of elementary school students with and without disabilities (Muyskens & Ysseldyke, 1998), student academic responding was higher in 1:1 contexts than in whole-class contexts, regardless of student demographics or times of day. Despite this, it is common for students in general education classrooms to spend the majority of their time in either whole-class or independent work activities (Altman & Kanagawa, 1994; Helmstetter et al., 1998; Logan & Malone, 1998). It seems clear that, by simply providing more opportunities for small group or partner learning, inclusive classrooms could increase the engaged behavior and academic achievement of students both with and without disabilities.
Co-operative learning and peer tutoring. Given the above, it is not surprising that one of the most common educational adaptations for inclusion cited in the literature is co-operative learning (Hunt, Staub et al., 1994; Fisher et al., 1995; King-Sears, 1997). In a co-operative learning program, instructional methods such as direct instruction, small-group instruction, individualization of roles and accountability, and independent practice are combined in a team-based learning approach. Assessment may then be individualized (i.e. all students may be given an individual assignment/test to assess what they have learned) or may be based on group performance.

In a seminal article on this topic, Slavin, Madden, and Leavey (1984) explored the effects of co-operative learning and individualized instruction on mainstreamed students. The participants included 117 "academically handicapped" students and 387 typical students. The authors concluded that co-operative learning programs resulted in increased sociometric status of students with disabilities. Students in co-operative learning groups also showed improvements with regard to teacher ratings of classroom behavior and self-confidence. There were no significant differences with regard to academic achievement for the students with disabilities, regardless of how they were taught. However, in an analysis of the full sample (i.e., students both with and without disabilities combined), students in the cooperative learning condition demonstrated significantly greater achievement than did those in the individualized instruction group. Subsequent research has repeatedly documented the benefits of co-operative learning for students both with and without disabilities (e.g., Hunt, Staub et al., 1994; Kamps, Barbetta, Leonard, & Delquadri, 1994; King-Sears, 1997). Equally important, the positive impact of co-operative learning on students' social interactions and self-concept development has also been documented (McDonnell, 1998).
Peer tutoring programs are a specialized form of co-operative learning. Students work together to learn academic content, with a typical student playing the role of tutor to a student with disabilities. Programs that have used students without disabilities as tutors have consistently proven to be effective in teaching a wide range of academic, self-help, communication and social skills to students with disabilities (King-Sears & Cummings, 1996; McDonnell, 1998). For instance, Kamps et al. (1994) investigated the impact of a classwide peer-tutoring program on reading skills and social interactions within classrooms that included students with autism. The program involved 30-minute peer tutoring sessions in reading. Results showed that reading skills and comprehension improved for students both with and without disabilities, and that social interactions between the students increased as well.

Instructional adaptations. Instructional adaptations have also been found to aid in the successful inclusion of students with developmental disabilities. For example, the provision of choice-making opportunities has been shown to increase engaged behavior and improve performance in children with disabilities (Dunlap et al., 1994; Moes, 1998). As an example, Downing et al. (1996) found that the most common instructional adaptation for three students with autism involved providing choices of activities, materials, groupings, and response methods. In one study (Moes, 1998) four children with autism improved their accuracy, productivity, and affect, and reduced their disruptive behavior when they were provided with opportunities to make choices regarding the order of task completion and the type of materials used.

When students are provided with alternatives to traditional written tasks, such as oral presentations, role plays, murals, or other creative projects, they are enabled to use their learning strengths (e.g. visual, auditory, tactile, and kinesthetic) rather than their deficits (Hay,
Muyskens and Ysseldyke (1998) found that active tasks increased the engaged behavior of students both with and without disabilities. Downing et al. (1996) also found that opportunities to move around the room, use tactile and kinesthetic learning for hands-on activities, and have multiple response options increased the participation of all three students with autism in their study. The option to use technology as an instructional adaptation has also been shown to increase achievement (Langone, 1998; Wisniewski & Alper, 1994). It can be used as an alternative instructional medium (e.g., for auditory and visual presentations) or as an alternative for student responding, such as occurs when students use augmentative communication devices, type stories, or present computer or slide show projects to demonstrate their knowledge in place of written assignments.

**Parallel instruction.** Differentiated (or parallel) instruction, in which curricula, goals, methods, pace, or conceptual level of instructional activities are varied according to individualized needs, has been shown to be one of the most effective methods for including students with disabilities (King-Sears, 1997; Maker, Nielsen, & Rogers, 1994; Sapon-Shevin, 1996). A number of case studies have demonstrated the effective use of parallel instruction (Downing et al, 1996; McDonnell, 1998; Ryndak et al., 1999). In all such cases, students were included in regular education classrooms and had assignments modified to their cognitive/skill levels. Parallel instruction increased other students' perceptions that their peers with disabilities were “a part of the class” and did “work like others do,” leading to an enhanced sense of belonging (Schnorr, 1990).

**Collaborative planning.** To assist students with diverse learning needs in the context of general education classrooms, it has been found that collaborative planning between special education and general classroom teachers as well as other individuals involved with students
with disabilities is essential (Glomb & Morgan, 1991; Hay et al., 1997; Hoerr, 1996; Langone, 1998). Teaching techniques and assessment tools from both special and regular education can be combined to determine the best instructional adaptations for an individual child. General education teachers who have regular opportunities to collaborate and consult with professional peers show evidence of increased instructional skills as well as decreased tendencies to make referrals to special education (Karagiannis et al., 1996). Research has also shown that students without disabilities can be resources for planning and should be included as members of educational planning teams (King-Sears, 1997; Staub et al., 1994). Frequently, students without disabilities who have grown up with a peer with disability can provide important information to new teachers about techniques, individual characteristics, and communication/behavioral needs.

Curriculum- and performance-based assessment. Programs that have been tailored to students’ learning strengths, rather than focussing solely on remediation, are likely to promote both academic achievement and engaged behavior for students with and without disabilities (Armstrong, 1994; Hearne & Stone, 1995). For this to occur, curriculum/performance-based assessment must take place on an ongoing basis. This type of assessment allows teachers to determine whether their teaching methods have resulted in desirable achievement gains in their students, and to tailor progressive lessons/activities to students’ strengths and needs (Ellison, 1992; Glomb & Morgan, 1991; King-Sears & Cummings, 1996; Plucker et al., 1996). The use of performance-based assessments has also been shown to significantly improve academic achievement for students both with and without disabilities (Dalton, Tinvan, Riley, Rawson, & Dias, 1995). These authors noted the value of diversifying assessment formats (for example,
using MI pathways) for all students, so that difficulties in one format (e.g. in written abilities) do not prevent students from demonstrating their knowledge and ability.

Community-based instruction. Community involvement and the use of the community as a natural setting for instruction has also been promoted in the inclusion literature (Langone, 1998; Tomlinson, Callahan, & Lelli, 1997). Students with developmental disabilities in particular have difficulties generalizing their learning to new settings (Alper & Ryndak, 1992; Cole & Meyer, 1991). Students without disabilities also benefit from opportunities to see the natural application of skills they have learned in the classroom -- for instance, the use of mathematics for a shopping trip, or the use of mapping concepts for hiking in a forest. Mentoring programs can serve to teach students the application of knowledge and skills to real life careers and settings. Embedded instruction, or the teaching of skills in natural daily activities, occurrences, and settings, has been shown to produce longer-lasting achievement outcomes for students with developmental disabilities (McDonnell, 1998).

In summary, research has demonstrated that specific instructional contexts, techniques, and service delivery models promote positive social and academic outcomes for students with and without disabilities. Despite this, many inclusive classrooms fail to incorporate these practices. Even very recent research has shown that many inclusive classrooms continue to engage primarily in whole-class or independent seatwork with few small-group or co-operative activities (Helmstetter et al., 1998; Logan & Malone, 1998). In some cases, there may also be a dearth of flexibility or choice with regard to the modality of instruction, the pace, or the options provided for student responding (Downing et al., 1996). Some inclusive classrooms make minimal use of technology, do not avail themselves of community-based resources or instruction, and use standardized written assessments the majority of the time.
Thus, a framework that incorporates the instructional contexts and activities promoted in the inclusion literature within a pedagogy that recognizes the diverse student population in inclusive classrooms may be required. MI theory, which will be reviewed in the section that follows, potentially provides such a framework.

**MI Theory**

MI theory appears to provide environments and pedagogies that promote many of the conditions/techniques promoted in the inclusion literature (Armstrong, 1994; Hoerr, 1996). MI instructional contexts include flexible groupings, co-operative work, and programs to develop students' social skills under the umbrella of the interpersonal and intrapersonal intelligences (Hoerr, 1996; Lazear, 1991a,b). Students in MI classrooms are provided with choice-making opportunities such as learning centres, individualized programming, multi-modality instruction, and flexible response activities (Teele, 1996). Interpersonal intelligence activities seek to promote social skills and interactions, while intrapersonal intelligence activities seek to develop students' self-awareness and provide individualized learning. MI theory places less emphasis on passive learning and rote memorization and more emphasis on alternative ways of learning, including movement, manipulation of objects, music, and social interactions (Armstrong, 1994; Teele, 1996). Students with disabilities are encouraged to pursue their interests through the use of their various intelligences and are exposed to the same quality of curricula, instructional techniques, interactional opportunities, and community-based vocational/mentoring programs as all other students (Evans, 1995).

MI encourages multiple means of assessment, including curriculum- or performance-based assessment as well as assessments completed in each of the "intelligences" domains, thus promoting multiple response activities and individualized programming (Blythe &
Gardner, 1990; Gardner, 1995). Teachers of art, music, drama, dance, and physical education must therefore take a leading role in helping academic-area teachers integrate these disciplines into traditional subject areas (Hearne & Stone, 1995). Gardner (1993) proposed the creation of an “assessment specialist” within the school, to aid teachers and students to assess students’ strengths and weaknesses using MI-based assessment scales. This promotes collaborative teaching, as teachers work together to assess and plan for students with and without disabilities (Ellison, 1992).

Blythe and Gardner (1990) suggested that not all learning can take place in the classroom. They proposed that a significant proportion of time should be spent venturing out into the community for further contextual exploring and learning. Gardner (1993) recommended a new role for a “school-community broker,” who would aid in the search for educational opportunities outside of the school. Community excursions with an MI model differ from typical field trips because classes return to the same places many times over the course of the year to pursue ongoing projects (e.g. studying crabs at the aquarium, or playing an instrument at the symphony’s training school). Thus, both the business community and parent groups become extended resources for the school, providing real-life experiences and training in ongoing projects/activities/mentorships for students (Jordan, 1996; Teele, 1996).

In principle, MI theory provides for a highly individualized curriculum model in which students pursue interests and strengths through a variety of activities in both the classroom and community. Emphasis is placed on the social, psychological, and academic growth of each student (Teele, 1996). MI seeks to “educate” in the full sense of the term, by encouraging general education, arts, physical education, and special education teachers to work together for integrated planning and instruction in both classroom and community settings. In this way,
MI theory attempts to bring together students, teachers, and community members in a truly “inclusive” educational system.

Unfortunately, very little empirical research has been conducted to explore the efficacy of MI theory in educational settings. Only one published study that provided empirical data was located during an exhaustive literature search. However, a small body of research has begun to emerge, especially a series of unpublished masters theses from St. Xavier University (all located as ERIC documents) that have investigated the social and academic benefits of MI curriculum for typical learners. Since these are the only empirical studies that were found pertaining to the social and academic benefits of MI for elementary-aged students, they will be reviewed briefly here.

MI and Social Outcomes

In the only published study that has reviewed outcomes of MI teaching and learning for elementary school students, Mettetal et al. (1997) conducted a study of teachers’, parents’, and students’ attitudes toward an MI curriculum. Participants for interviews included 26 teachers, 129 children, and 61 parents from a single school implementing an MI curriculum for the first time. Several methods of data collection, including participant observations, interviews, and surveys, were triangulated to increase validity. Three main themes emerged from the triangulation of the data. First, there was general acceptance of the concept of MI across all participants. Definitions of ability and disability had changed in all the participant groups since implementation of the MI curriculum, reflecting the notion that all students’ learning profiles included both strengths and weaknesses. Parents had developed increased respect for their children’s abilities as they began to change their conceptualization of “intelligence” (Armstrong, 1994; Eichinger & Downing, 1996; Ellison, 1992; Falvey et al.,
Second, there were generally positive reactions to school-wide implementation of the MI curriculum. Teachers, parents, and students all felt that students’ self-esteem had improved, that the students had enjoyed learning in this way, and that students’ individual strengths had been better recognized. Third, there was uneven implementation of the MI curriculum across classrooms, particularly in the first year of implementation.

Several studies have also explored, at least in a preliminary way, the effects of MI curriculum and instruction on students' behavior. Dare et al. (1997) conducted a study in which an MI curriculum was implemented in three schools in an attempt to decrease the degree of students' disruptive behavior. The MI intervention included activities and learning centres in each of the intelligences, with a focus on higher-order thinking skills and cooperative group work. A total of 81 students in kindergarten, fourth grade, and fifth grade took part in the study. A discipline record form, anecdotal records consisting of teacher journal observations, and mid-term grade reports were used to record the number of discipline referrals. The targeted kindergarten and fourth grade both showed significant decreases in disruptive behaviors. However, no significant behavioral differences were found in fifth grade, which had a relatively low rate of problem behavior during baseline.

Similar results have been found in several other studies. Layng, McGrane, and Wilson (1995) introduced MI curriculum and instruction to 78 fifth and sixth grade students in an elementary school. Over 50% of the students were observed engaging in disruptive behaviors during baseline observations. In the final week of the study, this rate had dropped to 22% of students. Lindvall (1995) also introduced an MI intervention program (including learning centres, activities in each of the intelligences, MI based assessments, etc.) to a third grade class with 17 students. In September, six of these students had behavior plans aimed at
reducing their disruptive/aggressive behaviors. By March, no students remained on behavior contracts. It is important to note that these are preliminary studies, with relatively small sample sizes. However, the overall findings appear to indicate that MI curriculum and teaching may have positive effects on student behavior.

MI and Academic Outcomes

Standardized tests are not a part of MI philosophy and teaching. Thus, concerns have been raised about the ability of teachers using MI curricula to prepare students for state standardized tests (Mettetal et al., 1997). In the published case study discussed previously, (Mettetal et al., 1997) state standardized test scores for grade three students in their school were reviewed. Students in grade three took the Indiana Statewide Testing for Educational Progress (ISTEP). The poverty rate within the school increased over both years of the study, which normally lowers test scores (Mettetal et al., 1997). Despite this change in demographics, and the fact that MI curriculum was not designed to increase standardized test scores, test scores during the first year of implementation were higher than during the previous year. Scores increased even more after the second year, when the MI curriculum was in place throughout the classrooms. When compared with other elementary schools in the same school district, the MI school showed a dramatic increase in test scores (from a mean ISTEP score of 70 to a mean of 85) that coincided with the implementation of the MI curriculum. The authors concluded that the implementation of an MI curriculum had benefited students both socially and academically. However, this was only a single case study and reflected only the learning of typical students.

Similarly, Greenhawk (1997) reported on the implementation of MI curriculum and instruction in an elementary school in Maryland. She documented the process of establishing
standards for assessment and implementation of MI in her school. Students in the school were required to complete state standardized tests called the Maryland School Performance Assessment Program. Once again, scores on the state tests rose (20%) with the implementation of MI curriculum. However, no specific data were reported beyond this overall figure.

As noted previously, engaged behavior is also used as an indicator of student involvement in learning and has been shown to predict academic achievement (Bulgren & Carta, 1993). Dare et al. (1997) investigated changes in students engaged behavior (time on/off task) and completion of academic assignments in the kindergarten, fourth, and fifth grade students in their study. Time off-task reduced significantly when an MI intervention was introduced in all three grades. In the fourth and fifth grade sites, incidences of incomplete assignments also reduced. Layng et al. (1995) measured the engaged behavior and rate of completed assignments in their sample of fifth and sixth grade students as well. Fifty-three percent of students were off-task during observations in September, compared to 8% during the final week of the intervention. However, the rate of incomplete assignments increased. The authors postulated that students' inexperience with co-operative group work and the time management skills involved may have played a role in this finding. In the study of a grade three class (Lindvall, 1995), disruptive behaviors decreased as engaged behavior increased; and report card grades in all subject areas increased, as did grades on written tests. This is particularly interesting because an MI curriculum places less emphasis on the use of written tests as assessment measures; nevertheless, students' performance on written tests improved, suggesting that there were no negative effects for the use of MI curriculum and instruction on traditional academic assessments.
The degree to which students actively participate (i.e., engage) in learning and complete assignments has also been used as a measure of motivation. Bartscher, Gould, and Nutter (1995) assessed motivation during implementation of MI intervention programs (including co-operative project work based on each of the intelligences) in third, sixth, and tenth grade classes in three different schools. Student surveys, observations, teacher journals, and completed homework assignments were all used as measures. The authors concluded that students' motivation for learning increased because homework completion rates rose; and because the majority of students indicated during interviews that the MI curriculum had motivated them and they would prefer to continue learning in this way. Ellingson, Long, and McCullough (1997) also used an MI-based intervention to improve student motivation. Twenty-two third graders and 53 middle school students participated. Students' attendance, time on-task, and class participation were all assessed. Attendance rates fluctuated, but their time on-task, ability to “use time wisely,” and their rate of asking and answering questions all improved.

Similarly, Beuscher et al. (1997) conducted a study that explored the efficacy of MI curriculum and instruction for improving student task engagement and academic achievement. Teacher observations, samples of student work, and anecdotal records were gathered over a 5-month period. Ninety-two students from four different classrooms in grades one, three, and five took part in the study. Interventions included a series of learning activities and materials that focussed on MI, higher-order thinking skills, and opportunities to work in co-operative groups through the interpersonal intelligence. The percentage of groups that displayed engaged behavior increased by 27%. There was a 22% gain in academic contributions, an 18% gain in following directions, a 35% gain in asking or responding to questions, and a 43%
gain in applying knowledge to other areas (a higher order thinking skill). Thus, it seemed that the MI intervention resulted in increased student engaged behavior.

In this study, there were also positive gains made in academic achievement from pretest to posttest (Beuscher et al., 1997). Students’ writing skills improved significantly in all classes. Assessment targeted 11 specific writing skills. Initially, 95% of the students used fewer than five of the skills in their writing, and no students used 80% or more of the skills consistently. At post-test, 87% of the students used using six or more of the writing skills; and 49% of these students used 80% or more of the skills consistently. Gains in reading scores were also noted. Third grade reading placement scores indicated that 88% tested at the instructional level or above after intervention, compared with 65% at pre-test. In fifth grade, 100% of the students tested at the instructional level or above post-intervention, compared with 93% at pre-intervention. There was also a 17% increase in the number of students who showed self-reflection in their journals; this was used as a measure of students’ ability to connect information to prior knowledge and experience, a higher-order thinking skill. The authors concluded that the use of MI curriculum and teaching strategies resulted in greater student engagement, improvements in academic achievement in the areas of reading and writing, and increased higher-order thinking skills.

Spelling skills are often thought of as rote skills that are best taught by drill and memorization. However, Brecher, Gray, Price, and Sayles (1998) documented the use of an MI-based intervention for spelling. Teachers in the study were concerned that, while students performed well on traditional spelling tests, they did not transfer the use of these spelling skills to their creative writing. An MI-based intervention was designed to implement centres based on each intelligence, in which students practiced spelling a list of high frequency words.
Results indicated that students showed significant improvement in the spelling of 100 high frequency words in their writing.

Albero et al. (1997) conducted specific research regarding the impact of an MI curriculum on reading. State reading scores for the target elementary school indicated that 20-35% of students did not meet the expected standards. Four classes of grade two, three, and four students participated in the study. Basal reading tests, which included the five basic components of vocabulary, comprehension, literature, decoding, and word study skills, were administered as pre- and post-test measures. In addition, portfolios, teacher observation checklists, and weekly child self-assessment logs were used as measures of students' progress in reading. Post-test measures indicated a growth in vocabulary (from 24-35% increase), comprehension (from 21-52% increase), and decoding (from 34-56% increase) skills for all four classrooms. Scores on the literature section of the tests showed a dramatic improvement of more than 30% (up to 51%), while scores for study skills in grades three and four grew by over 20%. These scores reflected a significant increase in reading comprehension following intervention. Portfolios, teacher observations, and students self-assessments also indicated that the intervention had increased students' self-awareness and motivation, and had improved behavior and interpersonal relationships while encouraging higher-level thinking. Gens, Provance, VanDuyne, and Zimmerman (1998) also documented positive effects of an MI intervention in reading. First and second grade students were introduced to MI-based stations and centres during language arts activities. Post-intervention data indicated that reading test scores improved and that there was an increase in the number of students who read at home.

From this review, it is clear that a small body of research has begun to document that implementation of MI curriculum and teaching activities has a positive effect on the social and
academic achievement of typical students (Ellingson et al., 1997; Hughes, 1995; Lane, Marquardt, Meyer, & Murray, 1997; Layng et al., 1995; Pierce, 1997; Strahan et al, 1996).

This research has documented positive outcomes related to social and engaged behavior, motivation, and academic achievement. Even traditional rote skills such as decoding in reading, spelling, grammar in writing, and achievement on written and standardized tests not emphasized in MI pedagogy appear to improve. However, no empirical research has been conducted to explore the efficacy of an MI curriculum for students with developmental disabilities. Given that MI curriculum and instruction includes many of the teaching techniques that have been shown to benefit students both with and without disabilities, it seems reasonable to predict that MI curriculum and instruction should benefit students with developmental disabilities in inclusive classrooms. The present study is intended to compare the social interactions and engaged behavior of students with developmental disabilities in inclusive MI classrooms and more typical inclusive classrooms.
CHAPTER 3

Method

Participants

Ten elementary school students (ages 6-12) with developmental disabilities (in this case, mental retardation, autism, or PDD-NOS) from a suburban school district participated in this study. Students with mental retardation were identified by the school district as being eligible for ministry funding in this category, based on psycho-educational assessments (including intelligence testing), medical diagnoses, and adaptive behavior assessments. Students with autism or PDD-NOS were identified by the school district based on medical diagnoses. All students were full time members of general education classrooms, although they, as well as some classmates, attended pull-out programs for English as a Second language or learning assistance (e.g., remedial reading) at times (2-4 times a week for 40 minute periods). Classes in all three schools were combined classes, meaning that students from two grade levels were assigned to one classroom (e.g., a grade 2/3 combination).

Primary classes (grades K-3) in this district have a maximum class size of 23 students. Grade 3/4 classes have a maximum of 25 students. Intermediate classes (grades 4-7) in this district have a maximum class size of 28 students. All classes that participated in the study were within two students of the maximum class size for the district (therefore ranged from 21-28 students). The district places a limit of three identified students with special needs within any one class, only one of whom can be “low incidence”; that is, have severe behaviors or severe/profound intellectual impairments. Five students were selected from schools in which MI pedagogy, instruction, and assessment were implemented. Five students were selected from an elementary school in which students with developmental disabilities were included
in typical general education classrooms in which no specific educational theory or pedagogy was applied. Students in the two groups were matched as closely as possible for (in order of priority): grade, disability status, ESL status, gender, and age. Students' demographics are presented in table 1 below.

Table 1

Student Demographics

<table>
<thead>
<tr>
<th>Group</th>
<th>School/Class</th>
<th>Student Name</th>
<th>Grade</th>
<th>Disability Status</th>
<th>ESL Status</th>
<th>Gender</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple</td>
<td>A/1</td>
<td>Alan</td>
<td>*5/6</td>
<td>Down's</td>
<td>No</td>
<td>Male</td>
<td>29/05/89</td>
</tr>
<tr>
<td>Intelligences</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A/1</td>
<td>Becky</td>
<td>*5/6</td>
<td>Mod. Int.</td>
<td>Yes</td>
<td>Female</td>
<td>01/04/89</td>
</tr>
<tr>
<td></td>
<td>A/2</td>
<td>Yusuf</td>
<td>*4/5</td>
<td>PDD</td>
<td>Yes</td>
<td>Male</td>
<td>31/07/90</td>
</tr>
<tr>
<td></td>
<td>B/1</td>
<td>Breanne</td>
<td>*2/3</td>
<td>Severe Int.</td>
<td>No</td>
<td>Female</td>
<td>25/05/91</td>
</tr>
<tr>
<td></td>
<td>B/2</td>
<td>Bert</td>
<td>1/2*</td>
<td>Autism</td>
<td>No</td>
<td>Male</td>
<td>06/12/91</td>
</tr>
<tr>
<td>Typical</td>
<td>C/1</td>
<td>Dylan</td>
<td>*5/6</td>
<td>Mild Int.</td>
<td>No</td>
<td>Male</td>
<td>29/05/89</td>
</tr>
<tr>
<td></td>
<td>C/2</td>
<td>Damon</td>
<td>1/2*</td>
<td>PDD</td>
<td>Yes</td>
<td>Male</td>
<td>23/11/92</td>
</tr>
<tr>
<td></td>
<td>C/3</td>
<td>Karen</td>
<td>4/5*</td>
<td>Down's –</td>
<td>No</td>
<td>Female</td>
<td>28/11/88</td>
</tr>
<tr>
<td></td>
<td>C/.3</td>
<td>Ken</td>
<td>*4/5</td>
<td>PDD</td>
<td>Yes</td>
<td>Male</td>
<td>01/02/90</td>
</tr>
<tr>
<td></td>
<td>C/4</td>
<td>Shayan</td>
<td>2/3*</td>
<td>Autism</td>
<td>Yes</td>
<td>Male</td>
<td>03/11/91</td>
</tr>
</tbody>
</table>

* is actual grade placement
Settings

The study was conducted in elementary school classrooms in a suburban school district of a large metropolitan city in Canada. The community served by the school district is an extremely multi-cultural community. Providing services to students for whom English is a second language has been a major challenge for the district, as has providing inclusive educational programs for students with developmental disabilities (some of whom also receive ESL supports). Elementary schools in this school district included students from kindergarten through grade seven.

The school district promoted a full inclusion model in which students with disabilities attended their neighborhood schools and were included in regular education classrooms. Special education and related services were provided within regular classrooms as much as possible, including services from special education teachers, ESL teachers, classroom assistants, speech-language pathologists, teachers of the deaf or visually impaired, and physio- and occupational therapists. However, some specialized pull-out programming based on individualized needs occurred in resource rooms or specialized settings for short periods of time (e.g. 30 min., 2-4 times per week).

Students in three separate schools within the district were observed. School A has implemented an MI curriculum and pedagogy on a school wide basis. This school had a population of 236, over 65% of whom receive ESL supports. MI curriculum and instruction has been provided at this school for several years, with a great deal of parent and community involvement and discussion. Two intermediate grade level combined classrooms that included three students with developmental disabilities were observed (i.e. one classroom included two students with developmental disabilities). School B is a large, suburban school
with a student population of 451, 22% of whom receive ESL supports. This school offers a dual track program (i.e. an English immersion and French immersion). Two classrooms in the English immersion program were observed (one primary and one a grade 3/4 combined), each of which included one student with developmental disabilities. This school has also had a pod of teachers who have devoted professional development time to implementing MI pedagogy, assessment, and instruction. The third school (school C) is an average sized school for the district, with a population of 375, approximately 35% of whom receive ESL supports. It is a typical elementary public school, in that it follows no particular pedagogy beyond following provincial curriculum guidelines. Five students in four classrooms (i.e. one classroom included two students with developmental disabilities) were observed. Classes of both intermediate and primary combined grades were observed. All three schools were suburban, with predominantly working and middle class populations.

Measurement

The study used methods of ecobehavioral assessment, which is a method used for studying effective instructional contexts in complex classroom environments (Greenwood, Carta, Kamps, & Areaga-Mayer, 1990; Logan & Malone, 1998). Ecobehavioral assessment was designed to reveal interrelationships between environmental variables (e.g., instructional activities and groupings, teacher behaviors, etc.) and child behavior (Greenwood, Schulte, Kohler, Dinwiddie, & Carta, 1986). The rationale for this type of assessment was that student achievement (both social and academic) within an educational program is determined for the most part by the interactions students have with their classroom environments and the people in these environments (Logan et al., 1997). Ecobehavioral assessment is defined as “the measurement of classroom situational factors that are temporally related to students’
behaviors" (Kamps, Leonard, & Greenwood, 1991, p. 202). Thus, ecobehavioral analysis measures the temporal relationship between environmental stimuli and students' response behaviors.

Ecobehavioral assessment has four major uses (Logan et al., 1997). First, it can be used to describe the instructional contexts of classrooms. For example, in a study discussed in Chapter 2, Logan and Malone (1998) used this methodology to explore the instructional contexts provided for students with developmental disabilities in general education elementary classrooms. Second, it can be used to compare instructional contexts across classrooms. Ecobehavioral assessment has therefore been used to describe and compare effective classroom instruction in both regular and special education settings (Kamps, Leonard, & Greenwood, 1995). For instance, in the Hunt, Farron-Davis, et al. study (1994), instruction, social interactions, and engaged behavior of students with severe developmental disabilities in general education and self-contained classrooms were compared. Third, it can identify instructional variables that are associated with high levels of students' engaged behavior and social interactions. As an example, Muyskens and Ysseldyke (1998) investigated instructional variables (especially, how academic activities were scheduled) that affected the engaged behavior of both students with and without disabilities. Finally, ecobehavioral analysis can be used to record changes in classroom, teacher, or student variables as a function of experimental manipulation. For example, Kamps et al. (1991) developed an experimental intervention to increase student response rates through the use of targeted instructional behaviors and measured the intervention effects.

In this study, ecobehavioral analysis was used for two main purposes. First, it was used to compare the engaged behavior and social interactions of students with developmental
disabilities in MI and typical inclusive classrooms. Second, ecobehavioral analysis was used to identify environmental variables that differed between the two classrooms and that may have been related to differences in students' engaged behavior and social interactions.

Data Collection

MS-CISSAR (Greenwood, Carta, Kamps, Terry, & Delquadri, 1994) is a software package that was developed and validated as an instrument for ecobehavioral assessment in mainstream classrooms. A 99-event taxonomy (divided into five ecological, four teacher, and four student subcategories) allows researchers to observe factors related to classroom environment, teacher, and student behavior that influence the social interactions and engaged behaviors of target students. The items in MS-CISSAR include ecological factors such as the type of activity in which students engage, the physical arrangement of a classroom, the types of classroom instructional groupings, and the settings in which observations take place. Student behaviors are broken down into three sub-categories including academic responses, competing responses and task management. Teacher variables include the number and type of adults involved in interactions with a student, the nature of those interactions, and the physical position of teachers in a room. MS-CISSAR was developed during a 3-year project that implemented standard software development design procedures, supplemented by several key studies designed to guide development and validation (Greenwood et al., 1994). Multiple studies were conducted to validate each of the subcategories involved in the taxonomy. Subsequently, MS-CISSAR has been used in several research studies exploring students engaged behavior and social interactions in mainstream classrooms (e.g., Greenwood et al., 1990; Kamps et al., 1991; Logan et al., 1997).
An online version of MS-CISSAR was used to gather and analyze data regarding students’ engaged behavior and peer interactions. For the purposes of this study, the taxonomy was downsized and codes re-grouped to more clearly reflect the variables and research questions under investigation. The selection of relevant variables to answer specific research questions, and the grouping of variables from MS-CISSAR for specific analysis has been reported in the literature and encouraged by the software’s developers (Greenwood et al., 1990; Logan et al., 1997).

**Independent Variable**

The independent variable in this study was classroom pedagogy. Specifically, participants were drawn from either a typical inclusive elementary-school classroom or a multiple intelligences classroom.

**Dependent Variables**

*Classroom environmental variables.* MS-CISSAR contains multiple codes for assessing the types of academic tasks to which students are assigned, and the instructional groupings in which these activities take place. For this study, tasks were operationally defined using MS-CISSAR codes. These codes were grouped to reflect traditional, rote paper-and-pencil tasks and tasks that allowed for multiple methods of instruction or responding. In addition, instructional groupings were coded using the original MS-CISSAR codes. See Appendix A and B for specific MS-CISSAR codes and definitions.

*Student response behaviors.* In seeking to assess the effectiveness of inclusion, many researchers have measured two constructs associated with students’ participation: time on task (engaged behavior), and social interactions.
Engaged behavior: Time on task, or engaged behavior, is commonly defined as the amount of time students spend attending to and working on academic material (Gresham, MacMillan, & Bocian, 1996; Logan et al., 1997). Engaged behavior has been well documented as a valid measure of the efficacy of inclusion and as a good predictor of student outcomes (Bulgren & Carta, 1993). Engaged behavior can be either active or passive, reflecting the difference between (active) participation and (passive) listening or observing (Hunt, Farron-Davis et al., 1994).

In general, there is a reasonable degree of consensus regarding a conceptual definition for being “on task,” and of many of the basic approaches to measuring “on task behavior” (e.g., observation-based time sampling procedures) (Logan et al., 1997). However, the operational definition of this concept has varied throughout the literature, particularly as it relates to students with severe disabilities, because it can be more difficult to determine whether such students are listening, communicating, etc. However, MS-CISSAR provides clearly defined and validated codes for each type of behavior, and thus eliminates uncertainty around the validity and reliability of these definitions. Thus, for this study, engaged behavior was defined using the codes provided by MS-CISSAR. These codes were grouped to reflect both active and passive engagement as well as non-engagement (i.e., “off task) behavior (see Appendix A and B for specific MS-CISSAR codes and definitions).

Social interactions: Social interactions are indications of students’ personal involvement with other members of the classroom community, including peers, teachers, aides, and others. Hence, they are considered to be measures of social inclusion in a classroom (Hunt, Farron-Davis et al., 1994). Examples of social interaction behaviors cited in the literature include looking at, vocalizing, reaching toward, playing with, smiling, and
talking to others (Brinker & Thorpe, 1984; Evans et al., 1992). Researchers agree that social interactions can and do include a variety of communicative behaviors between students with disabilities and others, including both verbal and nonverbal behaviors (Hunt, Farron-Davis et al., 1994).

For this study, social interactions were operationally defined using MS-CISSAR codes. These codes were grouped to reflect social interactions (including verbal and nonverbal interactions) and non-interactive behaviors. See Appendix A and B for specific MS-CISSAR codes and definitions.

Design

A causal-comparative design allows for the prediction of dependent variables based on an independent variable that has not been randomly assigned. A matched subjects small group design was used for the study, similar to other studies that have investigated the engaged behavior and social interactions of students with developmental disabilities in inclusive classrooms (e.g. Hunt et al., 1994).

Procedure

Observer Training

Two graduate students in special education were trained as observers using the MS-CISSAR software program. The program provides a training module online and a calibration video for training. The author first trained herself in all of the original MS-CISSAR codes and definitions using the programs training module and calibration video to 95% reliability. Following this, the new downsized taxonomy and new codes were used to re-code the calibration video by the author. The video was coded twice and intra-rater reliability was achieved at >95% for all categories and codes. Observers first reviewed the instrument
taxonomy and the revised categorical definitions, and learned the operational definitions for each of the variables. Observers then coded some of the appropriate tutorial scenarios with the new taxonomy and codes/definitions. Finally, observers coded the calibration video with the new taxonomy and codes until they achieved 90% reliability with the author’s ratings, and an interrater reliability check was conducted to insure 90% agreement using the operational definitions selected for this study. The two observers were told that the purpose of the study was to explore instructional contexts in the inclusive classrooms and their relationship to student response behaviors, but were not told either the hypotheses of the study or the independent variables under investigation.

Consent Procedures

The research proposal for this study underwent ethical review procedures at both the University and school district level. Principals and teachers at both schools were approached for their consent to conduct observations in classrooms in their schools. They were told that the purpose of the study was to explore instructional contexts in inclusive classrooms and their relationship to student response behaviors. Letters of consent were sent home to parents of potential participants and signed consent was obtained. All consent forms that were sent home were returned signed, thus the study had a 100% response rate.

Observations

Observations took place in classrooms during academic activity times. Observations were scheduled in one-hour blocks, but ranged in actual collection time due to unforeseen changes in teachers schedules (i.e. the teacher had arranged some special activity outside of the classroom), or unforeseen individual student activities (e.g. washroom breaks, therapy appointments, etc.). All students were observed for between four and five hours of
instructional time, reflecting the bulk of an instructional school day. Observations were scheduled for each student at different times of the day across several days, reflecting the different time periods and days of the week for an entire school week. Observations took place over a period of three months, from November to January, with a weeks break before the Christmas holidays and a weeks break afterwards to insure regular instructional activities. Greenwood et al. (1997) suggested that observers using MS-CISSAR be as unobtrusive in the classroom as possible. For this reason, observers were seated off to the side or at the back of the classroom in proximity to the target student where they could observe them without being in direct eye contact or view. Observers used momentary time sampling procedures, following a look, record, and rest cycle for each interval. Observational data are presented in Table 2.
Table 2

Observational Data

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Number of Observations</th>
<th>Total Hours:Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alan</td>
<td>5</td>
<td>4:15</td>
</tr>
<tr>
<td>Becky</td>
<td>5</td>
<td>4:42</td>
</tr>
<tr>
<td>Yusuf</td>
<td>5</td>
<td>4:53</td>
</tr>
<tr>
<td>Breanne</td>
<td>5</td>
<td>5:10</td>
</tr>
<tr>
<td>Bert</td>
<td>4</td>
<td>4:11</td>
</tr>
<tr>
<td>Dylan</td>
<td>5</td>
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</tr>
<tr>
<td>Damon</td>
<td>5</td>
<td>4:29</td>
</tr>
<tr>
<td>Karen</td>
<td>7</td>
<td>4:58</td>
</tr>
<tr>
<td>Ken</td>
<td>6</td>
<td>4:10</td>
</tr>
<tr>
<td>Shayan</td>
<td>5</td>
<td>5:00</td>
</tr>
</tbody>
</table>

Data Analysis

The MS-CISSAR program is capable of several different types of data analysis. Molar analysis allows for the investigation of behavioral frequencies, and was used to visually compare the overall percentage occurrence of engaged behaviors (active, passive, and non-engaged) and social interactions in the two types of classrooms. Percentage occurrence was computed by dividing the frequency of occurrence by the number of cycles observed overall (Greenwood et al., 1997). Percentage occurrence statistics are frequently cited in the literature as comparative measures of engaged behavior in various settings or conditions (Hunt, Farron-Davis et al., 1994; Logan et al., 1997). These analyses were used
for identification of any differences in the level or type of engaged behaviors and social interactions between the two groups. However, this program incorporates missing data into its’ statistical analyses (i.e., they are calculated as a percentage of the observed time).

Because observers left computers running when children left the room for washroom breaks, or brief activities which took place in other settings, the amount of missing data distorted the actual percentage of instructional time devoted to a particular task or instructional grouping, and the percentage of any particular category of student response behavior. For that reason, data were imported into SPSS, and a correctional formula which removed the missing data from each file and recalculated the frequencies observed for each variable as a percentage of actual instructional time was calculated for each category. Percentage occurrences, means for each student and group, and graphs were then calculated from the new variable statistics.

Conditional probability statistics are used to determine the probability of occurrence of a behavior given specific concurrent ecological factors (Greenwood, Carta, Kamps, & Delquadri, 1997). A Z score is computed, and level of significance is provided (see Greenwood et al., 1997 for statistical equations). Conditional probabilities were calculated to explore the effects of instructional groupings and types of academic activities on students’ engaged behaviors and social interactions. This type of data analysis should help to determine which specific factors in MI and typical classrooms are related to student behaviors.

Reliability

MS-CISSAR computes inter-rater reliability using a Kappa statistic. Inter-rater reliability was computed for 10% of observations, since the observers had been trained to be
reliable with the instrument during training sessions that occurred within one week prior to the study's initiation.

Research Questions, Hypotheses, and Analysis

In the next section, questions are posed which explore the possibility of identifying environmental variables which differ within the two classrooms, as well as investigating any differences in student behaviors related to inclusion.

MI and Typical Classrooms

**Question #1.** Is there a difference in the mean proportion of time participants with developmental disabilities spend on specific types of activities in the target MI classrooms as compared to the target typical classrooms?

**Hypothesis #1a.** Participants with developmental disabilities in the target MI classrooms will engage in fewer rote paper-and-pencil tasks and more activities that allow for multiple methods of responding than will participants in the target typical classrooms.

**Analysis:** SPSS calculations of the mean proportion, graphical display

**Question #2.** Is there a difference in the mean proportion of time participants with developmental disabilities spend in different types of instructional groupings in the target MI classrooms as compared to the target typical classrooms?

**Hypothesis #2a.** Participants in MI classrooms will have a higher mean proportion of co-operative, small-group instructional groupings and a lower mean proportion of whole-class and individual seatwork instructional groupings than will participants in the target typical classrooms.

**Analysis:** SPSS calculations of the mean proportion, graphical display
Question #3. Is there a difference in the mean proportions of engaged versus non-engaged behavior and of active versus passive engaged behavior for participants with developmental disabilities in the target MI classrooms as compared to the target typical classrooms?

Hypothesis #3a. There will be a higher mean proportion of engaged behavior for participants with developmental disabilities in the target MI classrooms as compared to the target typical classrooms.

Hypothesis #3b. Participants with developmental disabilities will be more actively engaged in the target MI classrooms as compared to the target typical classrooms.

Analysis: SPSS calculations of the mean proportion, graphical display

Question #4. Is there a difference in the mean proportion of social interactions versus non-interactive behaviors and of interactive partners for participants with developmental disabilities in the target MI classrooms than in the target typical classrooms?

Hypothesis #4a. There will be a higher mean proportion of interactive behavior for students with developmental disabilities in the target MI classrooms as compared to the target typical classrooms.

Hypothesis #4b. Participants in MI classrooms will spend more time interacting with peers and less time interacting with adults than will participants in typical classrooms.

Analysis: SPSS calculations of the mean proportion, graphical display

Question #5. Is there a difference in the mean proportion of the time participants with developmental disabilities spend engaged in the same tasks/activities as their classmates without disabilities in target MI classrooms as compared to target typical classrooms?
**Hypothesis #5a.** Participants with developmental disabilities in the target MI classrooms will spend a greater mean proportion of their time engaged in the same tasks/activities as their classmates without disabilities than will participants in the target typical classrooms.

*Analysis:* SPSS calculations of the mean proportion, graphical display

In the next two sections, questions are posed which explore the possibility of identifying environmental variables within the two classrooms that may account for any differences in student behaviors related to inclusion:

**Relationships between Environmental Variables and Student Interactions**

**Question #6.** In MI and typical classrooms, does the type of activity in which participants engage significantly affect the frequency of their social interactions and the type of interactive partner?

**Hypothesis #6a.** The type of activity in which students engage will significantly affect the social interactions of participants, such that rote paper-and-pencil tasks will be related to a lower frequency of social interactions than will activities that allow for multiple methods of responding. Further, rote paper-and-pencil tasks will be related to a lower frequency of interactions with peers and a higher rate of interactions with adults than will activities that allow for multiple methods of responding.

*Analysis:* Conditional probability and Z scores.

**Question #7.** In MI and typical classrooms, does the instructional grouping of in which participants are placed significantly affect the frequency of their social interactions and the type of interactive partner?
Hypothesis #7a. The instructional grouping in which participants are placed will significantly affect their social interactions, such that whole class and individual seatwork groupings will be related to a lower frequency of social interactions than will small group and co-operative groupings. Further, whole class and individual seatwork groupings will be related to a lower frequency of interactions with peers and a higher rate of interactions with adults than will small group, so-operative groupings.

Analysis: Conditional probability and Z scores.

Relationships between Environmental Variables and Student Engaged Behavior

Question #8. In MI and typical classrooms, does the type of activity in which participants engage significantly affect their engaged behavior?

Hypothesis #8a. The type of activity in which participants engage will significantly affect their engaged behavior, such that rote paper-and-pencil tasks will be related to a higher frequency of non-engaged (off task) behavior than will activities that allow for multiple methods of responding. Further, rote paper-and-pencil tasks will be related to a lower frequency of active responding and a higher rate of passive responding than will activities that allow for multiple methods of responding.

Analysis: Conditional probability and Z scores.

Question #9. In MI and typical classrooms, does the instructional grouping in which participants are placed affect their engaged behavior?

Hypothesis #9a. The instructional grouping in which participants are placed will significantly affect their engaged behavior such that whole class or independent seatwork will be related to a higher frequency of non-engaged behavior than will small group and co-operative groupings. Further, whole class and independent seatwork groupings will be a
related to a lower frequency of active responding and a higher frequency of passive responding than will small group co-operative groupings.

**Analysis:** Conditional probability and Z scores.
CHAPTER 4

Results

The purpose of this research was to investigate the extent to which MI practices appeared to facilitate inclusive outcomes for elementary-aged students with developmental disabilities. In this chapter, the results of inter-rater reliability checks will be presented first. Then, the research questions and their related hypotheses, stated previously in Chapter 3, will be reiterated along with the results relevant to each. The data will be displayed in tables or graphs, as appropriate.

Inter-rater Reliability

Inter-rater reliability statistics were calculated for 10% of the data (total time = 5 hours) across 4 students in 4 classrooms (2 MI classrooms and 2 typical classrooms). Reliability checks took place on each of 3 days that were distributed across 3 weeks. The MS-CISSAR software program that was used for observational recording calculates a Kappa statistic (Greenwood et al., 1997) for each category of variable (e.g. instructional groupings, task, etc.), and for the overall observations (i.e. across all categories). None of the categories had less than 95% agreement (range = 96.7%-99.1%). The mean Kappa statistic was .941 (range =.891-.971). Table 3 displays the reliability data for each coding category.
Table 3

Inter-Rater Reliability Data

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage Agreement</th>
<th>Kappa Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>97.7</td>
<td>0.941</td>
</tr>
<tr>
<td>Task</td>
<td>99.1</td>
<td>0.971</td>
</tr>
<tr>
<td>Instructional Grouping</td>
<td>97.9</td>
<td>0.968</td>
</tr>
<tr>
<td>Interactive Behavior</td>
<td>97.0</td>
<td>0.924</td>
</tr>
<tr>
<td>Interactive Partner</td>
<td>96.7</td>
<td>0.891</td>
</tr>
<tr>
<td>Engaged Behavior</td>
<td>97.9</td>
<td>0.950</td>
</tr>
</tbody>
</table>

A Kappa statistic is an indicator of agreement that factors in the probability of chance agreements. It is considered a more stringent indicator of agreement, and hence reliability, than percentage agreement calculations. A Kappa of .60 or larger is typically considered an acceptable level for inter-rater reliability (Greenwood et al., 1997). Overall, therefore, the data indicate a high level of agreement between raters with regard to the operational definitions for the variables studied.

In the next sections, the research questions will be restated and the relevant results will be reported for each hypothesis. Comparisons of group means will be followed by notable patterns in individual participants' results.
Research Questions, Hypotheses, and Analyses

MI and Typical Classrooms

Question #1. Is there a difference in the mean proportion of time participants with developmental disabilities spend on specific types of activities in the target MI classrooms as compared to the target typical classrooms?

Hypothesis #1a. Participants with developmental disabilities in the target MI classrooms will engage in fewer rote paper-and-pencil tasks and more activities that allow for multiple methods of responding than will participants in the target typical classrooms.

Results. This hypothesis was partially confirmed. Participants in both types of classrooms spent the majority of their time engaged in paper-and-pencil tasks. However, as expected, participants in MI classrooms spent slightly less time engaged in paper-and-pencil tasks (73.5%) than did those in typical classrooms (77.4%).

In contrast, there were greater differences regarding the amount of time participants spent in activities other than paper-and-pencil tasks in the two types of classrooms. As predicted, participants in MI classrooms spent substantially greater amounts of time engaged in activities involving multiple modes of responding (20.4%) than did participants in typical classrooms (11.8%). In addition, participants in MI classes spent only 5.8% of their school time with no instructional tasks assigned (e.g. “down time” or transition time), compared with 10.6% of such time for participants in typical classrooms. Figure 1 displays the group means for the type of task assigned.
Individual student differences also occurred with regard to the types of tasks presented, even for students in the same classroom, particularly in the MI classroom that included two participants. For instance, in the typical classroom that included two participants, one student spent 4% of his time on paper-and-pencil tasks, while the other spent only 20% of her time engaged in such activities. As well, in the MI classroom that included two students, one student spent 90% of his time on paper-and-pencil tasks, while the other spent only 59% of her time engaged in such activities.

**Question #2.** Is there a difference in the mean proportion of time participants with developmental disabilities spend in different types of instructional groupings in the target MI classrooms as compared to the target typical classrooms?

**Hypothesis #2a.** Participants in MI classrooms will have a higher mean proportion of co-operative, small-group instructional groupings and a lower mean proportion of whole-class and individual seatwork instructional groupings than will participants in the target typical classrooms.
Results. This hypothesis was partially confirmed. As predicted, participants in MI classes spent a greater amount of time in small group, co-operative activities than did participants in typical classrooms (MI = 11.3%, typical = 7.2%). However, contrary to what was predicted, participants in MI classes also spent a greater amount of time in whole class (MI = 49.7%, typical = 42.6%) and independent seat-work (i.e. working on their own with no assistance on the same task as the rest of the class) groupings than did participants in typical classes (MI = 20.7%, typical = 18.0%). Conversely, participants in typical classrooms spent more time in separate activities that were different from those of their peers (i.e. working on their own or with an adult on a different task from the rest of the class), or with no instruction at all (MI = 5.8%, Typical = 10.6%). Figure 2 displays the group means for the instructional groupings.

Figure 2. Group means for instructional groupings.

Question #3. Is there a difference in the mean proportions of engaged versus non-engaged behavior and of active versus passive engaged behavior for participants with
developmental disabilities in the target MI classrooms as compared to the target typical classrooms?

**Hypothesis #3a.** There will be a higher mean proportion of engaged behavior for participants with developmental disabilities in the target MI classrooms as compared to the target typical classrooms.

**Results.** This hypothesis was not confirmed. The overall engaged behavior rate was essentially equivalent for participants in both classes. In MI classrooms, engaged behavior was displayed by participants for a mean of 77.7% of intervals, while participants in typical classrooms were observed to be engaged for a mean of 78.0% of intervals. Figure 3 shows the group means for overall engaged behavior.

![Figure 3](image)

**Figure 3.** Group means for overall rates of engaged behavior.

It is notable that individual rates varied in both groups, from lows of 67% for one student in the typical group and 70% in the MI group, to highs of 86% in both groups. There
was no noticeable pattern based on primary or intermediate grade placement, type of
disability, or ESL status.

**Hypothesis #3b.** Participants with developmental disabilities will be more actively
engaged in the target MI classrooms as compared to the target typical classrooms.

**Results.** This hypothesis was confirmed. As predicted, participants in MI classrooms
were slightly more actively engaged and slightly less passively engaged than were
participants in typical classrooms. For participants in MI classrooms, the mean active
engagement rate was 49.0%, compared to 46.2% for participants in typical classrooms. On
the other hand, participants in typical classrooms had higher rates of passive engagement
(31.9%) compared to participants in MI classrooms (28.7%). Figure 4 displays the group
means for active, passive, and non-engaged behavior.

![Figure 4](image)

**Figure 4.** Group means for subcategories of engaged behavior.

Four out of the five participants in each group had higher rates of active engagement
than of passive engagement, an encouraging finding. The ratio for one of the participants was
actually quite close to even (40.9% active, 42.2% passive). Thus, only one participant, who was in a grade 2/3 typical classroom, spent a noticeable amount of time more passively engaged (47.5%) than actively engaged (36.6%). Once again, no observable trends emerged related to demographic data within the subjects.

**Question #4.** Is there a difference in the mean proportion of interactive behaviors versus non-interactive behaviors and of interactive partners for participants with developmental disabilities in the target MI classrooms as compared to the target typical classrooms?

**Hypothesis #4a.** There will be a higher mean proportion of interactive behavior for students with developmental disabilities in the target MI classrooms as compared to the target typical classrooms.

**Results.** This hypothesis was not confirmed. The rate of interactive behavior was essentially equivalent in both types of classrooms. In MI classrooms, participants were interactive 33.8% of the time; while in typical classrooms participants were interactive 33.9% of the time. Figure 5 displays results regarding social interaction rates by group.

![Interactive Behavior](image)

**Figure 5.** Group means for interactive behavior.
Individual interactive behaviors varied widely. In both groups, interactions occurred from 20% to 45% of the observed time. Thus, all participants spent less than half their time interacting with others. The two participants with the lowest interaction rates were a matched pair (i.e. one was in each type of classroom). Both were male, in intermediate classrooms, diagnosed with PDD, and received ESL supports.

- **Hypothesis #4b.** Participants in MI classrooms will spend more time interacting with peers and less time interacting with adults than will participants in typical classrooms.

**Results.** This hypothesis was confirmed. As predicted, participants in MI classrooms spent more time interacting with peers (14.3%) than did participants in typical classrooms (10.3%). As well, participants in MI classrooms spent less time interacting with adults (20.0%) than did participants in typical classrooms (23.8%). Figure 6 displays group means for interactive partners.

![Figure 6. Group means for interactive partners](image)

There were large individual differences in interactive partnerships in both groups. Two of the five participants in both groups spent less than 5% of their time interacting with peers. Conversely, two of the participants in the MI classrooms spent more than 25% of their
time interacting with peers. None of the participants in typical classrooms spent more than 20% of their time interacting with peers. Neither grade level, ESL, nor disability status, appeared to be related to the frequency of peer interactions.

**Question #5.** Is there a difference in the mean proportion of the time participants with developmental disabilities spend engaged in the same tasks/activities as their classmates without disabilities in target MI classrooms as compared to target typical classrooms?

**Hypothesis #5a.** Participants with developmental disabilities in the target MI classrooms will spend a greater mean proportion of their time engaged in the same tasks/activities as their classmates without disabilities than will participants in the target typical classrooms.

**Results.** This hypothesis was confirmed. As predicted, participants in MI classrooms spent much less time engaged in separate activities from that of their classmates (12.5%) than did participants in typical classrooms (21.8%). Figure 7 displays group means for time spent in separate activities.

![Figure 7. Group means for time spent in separate activities from classmates.](image)

Here, there was less group variability than in the areas discussed previously. Four of the five participants in the MI group spent less than 12% of their time in separate activities.
from their classmates, while in typical classrooms four of the five participants spent more than 12% of their time in separate activities. Only one participant in MI classrooms spent a substantial portion of his time in separate activities (35%), which raised the group mean; otherwise, the difference between the two types of classes would have been even greater.

Relationships between Environmental Variables and Student Interactions

**Question #6.** In MI and typical classrooms, does the type of activity in which participants engage significantly affect the frequency of their social interactions?

**Hypothesis #6a.** The type of activity in which students engage will significantly affect the social interactions of participants, such that rote paper-and-pencil tasks will be related to a lower frequency of social interactions than will activities that allow for multiple methods are responding. Further, rote paper-and-pencil tasks will be related to a lower frequency of interactions with peers and a higher rate of interactions with adults than will activities that allow for multiple methods of responding.

**Results.** This hypothesis was partially confirmed. The unconditional probability that interactive behavior would occur during any particular task was .3514. This means that if there was no effect of task on social interaction, participants should have interacted about 35% of the time for each task condition. Neither paper-and-pencil tasks (conditional probability (CP) = .3575, $Z = .34, p > .05$), nor multiple response activities (CP = .3787, $Z = .91, p > .05$), were significantly related to overall interactive behavior. The “no task” condition (i.e. down time or no instruction), was significantly negatively related to interactive behavior (CP = .24, $Z = -2.70, p < .01$). As well, multiple response activities were significantly related to the rate of interactions with peers (UP = .1382, CP = .1887, $Z = 2.72, p < .01$).
**Question #7.** In MI and typical classrooms, does the instructional grouping in which participants are placed significantly affect the frequency of their social interactions?

**Hypothesis #7a.** The instructional grouping in which participants are placed will significantly affect their social interactions, such that whole class and individual seatwork groupings will be related to a lower frequency of social interactions than will small group, co-operative groupings. Further, whole class and individual seatwork groupings will be related to a lower frequency of interactions with peers and a higher rate of interactions with adults than will small group, co-operative groupings.

**Results.** This hypothesis was partially confirmed. The unconditional probability that a particular instructional grouping was related to interactive behavior was .3519. As predicted, whole class instructional groupings (CP = .2123, Z = -6.81, p < .001) were significantly negatively associated with interactive behavior. However, independent groupings were not significantly associated with interactive behavior either positively or negatively (CP = .4041, Z = 1.84, p > .05). Furthermore, as expected, small group (CP = .7659, Z = 10.53, p < .001) and one-to-one groupings (CP = .5630, Z = 6.40, p < .001) were both significantly positively associated with interactive behavior. Thus, participants were less likely to interact when placed in whole class or independent seatwork activities than they were to interact when placed in co-operative small groups or one to one activities.

The investigation of the relationship between instructional grouping and the type of interactive partner revealed some interesting patterns. Small group structures were significantly associated with interactions with both adults (UP = .2137, CP = .3436, Z = 4.29, p < .001), and peers (UP = .1388, CP = .4208, Z = 11.56, p < .001). However, as can be seen by the magnitude of the Z scores, participants were much more likely to be interacting with
peers than with adults when placed in small groups. A Z score of 11.56 is extremely high, and indicates a very strong relationship between small group structures and peer interactions. In contrast, one-to-one grouping structures were significantly negatively associated with peers as interactive partners (UP = .1388, CP = .0605, Z = -3.84, p < .001), and significantly positively associated with adult interactive partners (UP = .2137, CP = .5079, Z = 11.63, p < .001). Again, a Z score of 11.63 is extremely high, and suggests a very strong relationship between one-to-one groupings and interactions with adults. As noted previously, whole class groupings were significantly negatively associated with interactive behavior, and thus were significantly negatively associated with both types of interactive partners (Adults: UP = .2137, CP = .1290, Z = -5.3, p < .001. Peers: UP = .1388, CP = .0838, Z = -4.26, p < .001). Independent groupings were not significantly associated with interactions with adults; however, they were significantly positively associated with peer interactions (UP = .1388, CP = .2160, Z = 4.31, p < .001). The relationship between instructional groupings and student engaged behavior is evident in the patterns of Z scores in Table 4 below.

Table 4.

<table>
<thead>
<tr>
<th>Instructional Grouping</th>
<th>Interactive Partner</th>
<th>Adult</th>
<th>Peer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Class</td>
<td>Z = -5.30, p &lt; .001</td>
<td>Z = -4.26, p &lt; .001</td>
<td></td>
</tr>
<tr>
<td>Small Group</td>
<td>Z = 4.29, p &lt; .001</td>
<td>Z = 11.56, p &lt; .001</td>
<td></td>
</tr>
<tr>
<td>Independent</td>
<td>Z = -1.24, p &gt; .05</td>
<td>Z = 4.31, p &lt; .001</td>
<td></td>
</tr>
<tr>
<td>One to One</td>
<td>Z = 11.63, p &lt; .001</td>
<td>Z = -3.84, p &lt; .001</td>
<td></td>
</tr>
</tbody>
</table>
Relationships between Environmental Variables and Student Engaged Behavior

Question #8. In MI and typical classrooms, does the type of activity in which participants engage significantly affect their engaged behavior?

Hypothesis #8a. The type of activity in which participants engage will significantly affect their engaged behavior, such that rote paper-and-pencil tasks will be related to a higher frequency of non-engaged (off task) behavior than will activities that allow for multiple methods of responding. Further, rote paper-and-pencil tasks will be related to a lower frequency of active responding and a higher rate of passive responding than will activities that allow for multiple methods of responding.

Results. This hypothesis was partially confirmed. The unconditional probability that task was associated with non-engaged behavior was .22. Contrary to the hypothesis predicted, paper-and-pencil tasks were not significantly related to non-engaged behavior (CP = .22, Z = .131, p > .05). However, as predicted, when participants were assigned activities that allowed for multiple methods of responding, they were significantly less likely to be off task (not engaged), CP = .14, Z = -3.351, p < .001. Of course, the no task condition was significantly positively associated with non-engagement, as it is impossible to be engaged when no task is assigned (CP = .36, Z = 4.542, p < .001).

The unconditional probability that tasks were related to active engagement was .47. Again, contrary to the prediction, paper-and-pencil tasks were not significantly associated with active engagement in either direction (CP = .46, Z = -.738, p > .05). However, as expected, activities that allowed for multiple methods of responding were significantly associated with active engagement (CP = .59, Z = 3.564, p < .001).
The unconditional probability that tasks were related to passive engagement was .30. Contrary to the hypothesis, neither paper-and-pencil tasks (CP = .31, Z = .883, p > .05), nor activities with multiple response opportunities (CP = .25, Z = -1.795, p > .05) were significantly associated with passive engagement.

**Question #9.** In MI and typical classrooms, does the instructional grouping in which participants are placed affect their engaged behavior?

**Hypothesis #9a.** The instructional grouping in which participants are placed will significantly affect their engaged behavior such that whole class or independent seatwork will be related to a higher frequency of non-engaged (off task) behavior than will small group and co-operative groupings. Further, whole class and independent seatwork groupings will be related to a lower frequency of active responding and a higher frequency of passive responding than will small group co-operative groupings.

**Results.** This hypothesis was partially confirmed. The unconditional probability that instructional grouping was associated with non-engaged behavior was .22. Contrary to the prediction, neither whole class (CP = .20, Z = -1.44, p > .05), one to one (CP = .23, Z = .33, p > .05), nor independent seatwork groupings (CP = .24, Z = 1.16, p > .05) were significantly associated with non-engaged behavior. However, as predicted, small group structures were significantly negatively related to non-engaged behavior such that students in small groups were significantly less likely to be off task (not engaged) (CP = .14, Z = -2.68, p < .01) than were students in any other grouping arrangement.

The unconditional probability that instructional groupings were associated with active engagement was .47. As predicted, whole class groupings were significantly related to a lower frequency of active engaged behavior (CP = .36, Z = -4.92, p < .001). In contrast,
small group (CP = .69, Z = 5.02, p < .001), independent (CP = .62, Z = 4.64, P < .001), and one to one groupings (CP = .58, Z = 2.91, p < .01) were all significantly related to higher rates of active engagement.

The unconditional probability that instructional groupings were related to passive engagement was .30. Whole class groupings were significantly associated with higher levels of passive engagement (CP = .43, Z = 7.60, p < .001). By contrast, one on one (CP = .16, Z = -4.46, p < .001), small group (CP = .16, Z = -3.86, p < .001), and independent groupings (CP = .12, Z = -6.83, p < .001) were all significantly associated with lower levels of passive engagement. Once again, the hypothesis that whole class structures would promote passive engagement (as opposed to active engagement) was confirmed. In addition, small group arrangements appeared to reduce passive engagement and promote active engagement. However, independent seatwork, which was predicted to be associated with passive engagement, was actually associated with active engagement. The relationship between instructional groupings and student engaged behavior is evident in the patterns of Z scores in Table 5 below.

Table 5

<table>
<thead>
<tr>
<th>Instructional Grouping</th>
<th>Active</th>
<th>Passive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Class</td>
<td>Z = -4.92, p &lt; .001</td>
<td>Z = 7.60, p &lt; .001</td>
</tr>
<tr>
<td>Small Group</td>
<td>Z = 5.02, p &lt; .001</td>
<td>Z = -3.86, p &lt; .001</td>
</tr>
<tr>
<td>Independent</td>
<td>Z = 4.64, p &lt; .001</td>
<td>Z = -6.83, p &lt; .001</td>
</tr>
<tr>
<td>One to One</td>
<td>Z = 2.91, p &lt; .01</td>
<td>Z = -4.46, p &lt; .001</td>
</tr>
</tbody>
</table>
Summary

To summarize, the results indicated that participants in MI classes were more likely to:

• be assigned activities that involved multiple methods of responding (hypothesis confirmed)

• be involved in whole class, small-group, and independent seatwork instructional groupings (hypothesis partially confirmed)

• be involved in the same activities as their typical peers (hypothesis confirmed)

• be more actively engaged in the activities of their classroom (hypothesis confirmed); and

• interact with typical peers (hypothesis confirmed)

In contrast, participants in typical classrooms were more likely to:

• be assigned paper-and-pencil tasks (hypothesis confirmed)

• have no task assigned to them (i.e., be engaged in “down time” or “transition time”)

• be involved in separate one-to-one one activities that differed from those of their classmates (hypothesis confirmed)

• be passively engaged (hypothesis confirmed); and

• interact with adults (hypothesis confirmed)

The following environmental factors were associated with interactive behavior or interactive partners:

• whole class instructional groupings were associated with lower rates of social interaction (hypothesis confirmed)
• small group and one-to-one groupings were associated with higher rates of social interaction (hypothesis partially confirmed)

• multiple response activities were associated with higher rates of peers as interactive partners (hypothesis confirmed)

• small group and independent seatwork groupings were associated with higher rates of peers as interactive partners (hypothesis partially confirmed); and

• one-to-one activities were associated with adults as interactive partners

The following environmental factors were associated with engaged behavior:

• multiple response activities were associated with higher levels of engaged behavior and higher levels of active engagement (hypothesis confirmed)

• small group structures were associated with higher levels of engaged behavior and higher levels of active engagement (hypothesis confirmed)

• whole class groupings were associated with higher levels of passive engagement (hypothesis confirmed)

• independent and one-to-one groupings were associated with active engagement (hypothesis not confirmed)

Finally, the following hypotheses were not confirmed:

• a higher rate of overall engaged behavior for participants in MI classrooms

• a higher rate of overall social interaction for participants in MI classrooms

• a lower rate of whole class and independent seatwork groupings for participants in MI classes

• paper-and-pencil tasks were not associated with either interactive behavior or engaged behavior
• independent groupings were not associated with lower rates of interactive behavior

• whole class and independent seat work groupings were not associated with lower levels of engaged behavior

• independent groupings were not associated with either higher levels of passive engagement, or lower levels of active engagement

To summarize, single-factor differences in the experiences of the participants in the two types of classrooms were often subtle. However, cumulatively they suggest that participants in MI classrooms were more involved in the social and academic life of their classrooms. This was evident in higher rates of peer interaction and active engagement, and substantially lower rates of separate activities from those of their classmates. These differences may have been promoted by increased opportunities to take part in activities that involved multiple methods of responding and small group co-operative structures.
CHAPTER 5

Discussion

Inclusion has been shown to have many positive benefits for students with developmental disabilities. Effective inclusion for these students should promote both their social interactions, especially with peers, and their active, engaged behavior in the learning activities of the classroom. Social interactions with typical peers have been shown, in turn, to promote the development of social skills, self-concept, happiness, motivation, and academic skills (Grenot-Scheyer, 1994; Lee & Odom, 1996; Logan et al., 1998). Active academic engagement (i.e. being “on-task” and actively involved in learning) has been found to promote social, academic, and communicative development (Bulgren & Carta, 1993; Kamps et al., 1991; Sindelar et al., 1989).

Proponents of MI theory have proposed that an MI approach to instruction and assessment facilitates inclusion because it individualizes instruction and thereby meets the needs of a diverse student population (Blythe & Gardner, 1990; Eichinger & Downing, 1996; Teele, 1996). Theoretically, instruction based on MI principles should facilitate both the social interactions and engaged behavior of students with developmental disabilities, because it includes many of the types of instructional activities and grouping structures that have been promoted in the inclusion literature, such as activities that allow for multiple methods of responding and small-group co-operative structures (Hoerr, 1996; Lazear, 1991 a, b).

Participants in two types of elementary school classrooms were observed in this study: inclusive classrooms that promoted MI pedagogy and typical inclusive classrooms. The experiences of the participants in these two types of classrooms were more alike than different in terms of the educational practices to which they were exposed, their rates of engaged
behavior, and their rates of interaction. However, subtle differences in the instructional activities and grouping structures in the two types of classrooms were evident and may have influenced the nature of participants’ engaged behavior and with whom they interacted.

The present study is unique in that it explored differences between two pedagogically different types of inclusive classrooms, rather than between segregated and inclusive classrooms. Considerable past research has compared the engaged behavior and social interactions of students with developmental disabilities in segregated versus inclusive settings (e.g. Altman & Kanagawa, 1994; Helmstetter et al., 1998; Saint-Laurent et al., 1993). In such comparisons of placement settings, differences in outcome scores ranging from 8% to 30% (e.g. Helmstetter et al., 1998; Logan et al., 1997) have been reported as having clinical significance. A second, smaller body of literature has reported outcomes within single settings with regard to students’ engaged behavior and social interactions in various grouping structures, specialized programs, etc. In these studies, smaller differences in the 3% to 8% range have been reported as being of interest (e.g. Greenwood et al., 1990; Hunt, Alwell et al., 1996). Since the present study is more similar to this latter body of research than that which has compared segregated and inclusive classrooms, one would expect smaller differences (i.e. in the 3% to 8% range) to be worthy of discussion.

**Environmental Differences**

**Instructional Activities**

*Overall instructional time.* Participants in MI classrooms had a larger percentage of their school day devoted to instructional activities than did those in typical classrooms (MI = 94.2%, typical = 89.4%). Conversely, participants in typical classrooms had almost twice as much non-instructional time (i.e. “down time” or transition time: MI = 5.8%, typical =
10.6%). Both of these rates are substantially lower than those reported in previous research, where scores in the 30% to 50% range for non-instructional time are common (Helmstetter et al., 1998; Logan & Malone, 1998). However, in the present study, observations were conducted only during academic activity times rather than across the school day; thus, the percentages do not include scheduled non-instructional times such as recess, lunch, gym, library, etc. Because of this, the results may be more comparable to Hollowood et al.'s “used time” (1994), which was defined as the percentage of time allocated for instruction that was actually used for this purpose. Even with this comparison, the present study revealed that participants in both types of classrooms were involved in instruction for over 89% of the allocated instructional time, compared to the 57% to 60% rates reported by Hollowood et al.

Past research has compared academic versus life skills instruction with regard to engaged behavior (Logan & Malone, 1998; Logan et al., 1997). Only one study of preschoolers with developmental disabilities (Altman & Kanagawa, 1994) compared engaged behavior in four sub-types of academic activities: “group activities,” “transitions,” “free choice,” and “seat work.” However, these categories were a combination of grouping structures, timing (i.e. transition was the finishing or starting of a new task), and task, and did not specifically break down academic tasks based on the type of task regardless of the grouping structure or timing of the activity. The present study was unique, therefore, in exploring the relationship between specific types of academic tasks, instructional groupings, and engaged behavior. The following sections discuss findings related to this exploration.

**Paper-and-pencil tasks.** Participants in both types of classrooms spent a large percentage of their instructional time involved in paper-and-pencil tasks (including all types of traditional rote, linguistic activities such as lectures, workbooks/worksheets, etc.). However,
participants in MI classrooms spent slightly less time engaged in such tasks (73.5%) than did their typical classroom counterparts (77.4%). The finding that participants in MI classrooms spent only 3.9% less time on paper-and-pencil tasks in MI classrooms was unexpected, given the fact that MI theory promotes multi-sensory and multiple response activities and a decreased emphasis on traditional rote “seatwork” tasks (Armstrong, 1994; Teele, 1996).

However, because participants in the target MI classrooms spent more total time in instruction (as discussed previously), one might have predicted that they would evidence higher rates of all types of instructional activities, including paper-and-pencil tasks. Thus, the fact that participants in the MI classrooms had even slightly lower rates of paper-and-pencil tasks may be noteworthy, as it is indicative of a higher ration of pencil-and-paper tasks to total instructional time. The schools in which this study was conducted operated for 5 hours a day, not including lunch hour. Recess occurred for twenty minutes a day, and library and gym for two forty minute periods a week each. Thus on any given day, (with recess and library/gym removed from the equation), there were 248 minutes a day available for instruction. Participants in MI classrooms were coded as having 94.2% of this time actually allocated to instruction, which translates to 234 minutes of instructional time. Given that 73.5% of this time was devoted to paper-and-pencil tasks, participants in MI classrooms were involved in paper-and-pencil tasks for 172 minutes a day, or almost three hours a day. A similar process indicates that participants in typical classrooms were involved in paper-and pencil tasks for exactly the same amount of time (172 minutes a day). Yet, MI classrooms devoted more overall time to instruction, thus paper-and-pencil tasks constituted a larger percentage of the actual instructional time in typical classrooms than they did in MI classrooms.
Other types of tasks. Differences in the types of tasks assigned to participants became more evident in the results related to the types of activities other than paper-and-pencil tasks that occurred. As predicted, participants in MI classrooms spent considerably more time in activities with multiple response methods (20.4%; which included non-traditional, hands-on creative tasks such as role plays, music, dance, crafts, constructive activities, etc.) than did participants in the target typical classrooms (11.8%). MI theory places an emphasis on individual learning styles, and thus challenges the traditional practice of educating all students in the same subjects with the same materials (Blythe & Gardner, 1990). Instead, MI proponents suggest that curricula should be responsive to students’ interests, personal experiences, and abilities, and should be taught using multiple entry points to important concepts (Gardner, 1995). Thus, students in MI classrooms should be involved in actively choosing the activities through which they gather information and represent learning in individualized ways (Teele, 1996). This prediction was confirmed by the results of the present study, which suggests that students’ access to multiple methods of responding occurred almost twice as often in MI than in typical classrooms.

Instructional Groupings

Whole class groupings. Participants in both types of classrooms spent a large percentage of their day in whole class groupings (MI = 49.7%, typical = 42.6%). The finding that whole class groupings were predominant is congruent with past research, and the percentages of time spent in whole class groupings in this study are within the ranges found in previous literature (e.g. Altman & Kanagawa, 1994; Helmstetter et al., 1998; Logan et al., 1997; Logan & Malone, 1998).
"Whole class" was coded when participants were engaged in the same instruction as the rest of their class. Since MI theory promotes individualized instruction and differentiation of the curriculum and activities (Evans, 1995; Teele, 1996), the finding that participants in MI classrooms were more often coded as being involved in whole class activities was unexpected. However, this may have been related to the higher rate of multiple response activities experienced by participants in MI classrooms, since such activities are less likely to require modifications or adaptations, and thus result in participants’ being able to participate in activities in which the whole class was engaged. For instance, an activity that involves a specific set of literacy skills, such as a workbook or worksheet, is likely to require that an alternative, modified activity be provided to a student with a developmental disability. In the present study, if such an alternative activity was provided, “whole class” would not have been coded. On the other hand, an activity that involves multiple methods of responding, such as a role play or multi-media craft activity, is unlikely to necessitate the assignment of a different type of task for such a student, and would have resulted in a “whole class” code.

Other instructional groupings. Because there was more total instructional time for participants in the target MI classrooms, one might have predicted higher rates of all types of instructional groupings for the MI participants. In fact, this was the case, although the differences were subtle. Participants in MI classrooms were more often placed in small group activities (MI = 11.3%, typical = 7.2%) and engaged in independent seatwork (i.e. working on the same task as the rest of the class, with no assistance) (MI = 20.7%, typical = 18.0%).

The rate of small group activities is slightly lower than that found in previous research (i.e., 16% to 17%) (Logan et al., 1997; Logan & Malone, 1998). Given previous assertions that MI supports the use of co-operative learning, which typically occurs in small groups
(Brownlie & MacDonald, 1996-97; Falvey, Givner, & Kimm, 1996), it is somewhat surprising that there were not more small group activities experienced by participants in the MI classrooms. However, this may be an artifact of the coding scheme used in the present study. “Whole class” was coded whenever the entire class was engaged in the same activity. As a result, even when students were working in small groups on co-operative tasks, if the entire class was engaged in the same activity, this was coded as “whole class.” Thus, the rates of small group, co-operative structures may have been underestimated by the coding scheme.

The results with regard to small group activities may be more indicative of the degree of curriculum differentiation that occurred in the two types of classrooms, since “small group” was coded whenever a participant was involved with a small group of other students in a task that differed in some way from the activities of others in the class. For instance, instructional activities such as guided reading, learning centres, learning stations, and so forth which involve small groups of students working on a variety of different tasks were coded as “small group.” MI theory supports the use of such individualized instruction, multiple means of learning and responding, and individualized instructional techniques (Blythe & Gardner, 1990; Evans, 1995). Thus, while the finding that participants in MI classrooms were more often exposed to such activities was predicted, the overall levels of small group engagement in both types of classrooms were unexpectedly low.

Separate activities. Participants in typical classrooms spent considerably more time in separate activities from their peers (coded as “one-to-one”: MI = 12.5%, typical = 21.8%) or engaged in no instruction (MI = 5.8%, typical = 10.6%) than did participants in MI classrooms. In fact, two of the five students in the typical classrooms spent close to 50% of their time engaged either in separate activities or in no instruction. The other three students
spent from 20% to 30% of their time in similar circumstances. Clinically, this translates to
between one to two-and-a-half days per week not involved in the activities of their
classrooms, for a total of one to two weeks every month! In contrast, in the MI classrooms,
only one student spent a substantial portion of his time in separate activities or with no
instruction (44%). Four out of the five students spent less than 15% (and as low as 8%) of
their time in these circumstances. Thus, 85% or more of students’ time was spent involved in
the instructional activities of the MI classrooms.

A sense of belonging has a critical impact on children’s psychological well-being, and
children who lack this sense have been shown to be at risk for loneliness, peer rejection,
isolation, and powerlessness (Salisbury et al., 1995; Strully & Strully, 1985; Williams &
Downing, 1998). Opportunities for students with developmental disabilities to interact with
typical peers and take part in activities that require co-operation appear to increase students’
sense of belonging (Alper & Ryndak, 1992; Janney & Snell, 1996; Strain et al., 1984). In
addition, participating in the same/tasks and activities as the rest of the class has been shown
to promote students’ sense of belonging and self-esteem (Schnorr, 1990; Williams &
Downing, 1998). Thus, the finding that participants in typical classrooms spent less time in co­
operative groups and spent from 20% to 50% of their day either with no instruction or in
separate activities raises concerns for these students’ sense of belonging within their
classrooms.

Differences in Student Response Behaviors

Engaged Behavior

Overall comparisons. The overall rates of engaged behavior for participants in the two
types of classrooms were essentially equivalent (MI = 77.7%, typical = 78%). These rates are
within the range previously established in the inclusion literature (Helmstetter et al., 1998). Previous research has documented increases in engaged behavior when students are provided with alternatives to traditional written tasks, as well as opportunities to work in small groups with peers as instructors (Altman & Kanagawa, 1994; Hay et al., 1997; Hunt, Staub, et al., 1994; Logan et al., 1997; Muyskens & Ysseldyke, 1998). Since participants in the target MI classrooms were observed to be involved more often in the types of grouping structures and activities that are typically associated with engagement, a higher rate of engaged behavior was expected for them. The unexpectedly high levels of engagement for participants in typical classrooms (i.e., equal to that of participants in the MI classrooms) might have occurred because of the higher frequency of separate activities for participants in these classrooms; such separate activities, which typically involve one-to-one adult supervision, have also been found to promote engaged behavior, both in past research as well as the present study (Helmstetter et al., 1998; Logan et al., 1997; Muyskens & Ysseldyke, 1998).

Active engagement. Participants in MI classrooms had slightly higher rates of active engagement than did participants in typical classrooms (MI = 49%, typical = 46.2%). Activities that allowed for multiple methods of responding were significantly associated with active engagement, as were small group and independent grouping structures, all of which were experienced by participants more often in MI classrooms. This probably explains the slightly higher levels of active engagement for participants in MI classrooms.

Participants in both types of classrooms had high levels of active engagement relative to that found in previous literature, in which rates around 36% are common (e.g., Logan et al., 1997). It is somewhat surprising that the rates of active engagement in the present study exceeded those in previous research, given the low rates of small group instruction and
multiple response activities found in both types of classrooms. However, the participants in this study were not physically disabled (although some might have had fine motor difficulties), while students with severe physical disabilities were included in the research samples of several previous studies (e.g. Helmstetter et al., 1998; Logan et al., 1997). This might have been reflected in the lower rates of active engagement found in those studies, since students with severe physical disabilities probably would have been unable to perform many types of activities (e.g. writing, cutting, gluing, etc.) associated with active engagement.

**Passive engagement.** Participants in typical classrooms had higher levels of passive engagement than did participants in MI classrooms (MI = 28.7%, typical = 31.9%). The type of task was not significantly related to passive engagement. Only whole class groupings were significantly positively associated with passive engagement. Since participants in MI classrooms were more often observed to be in whole class groupings, it is unclear why participants in typical classrooms exhibited higher levels of passive engagement. This warrants further study.

**Individual differences.** Generally, students were more actively than passively engaged, which is somewhat surprising given the whole class activity rates. Nevertheless, it is notable that only three participants spent more than 50% of their time actively engaged, and none reached 60% of the time. Given the large body of research suggesting that active, hands-on learning maximizes academic development (e.g., Fisher et al., 1995; King-Sears, 1997), the fact that participants in both types of classrooms were actively engaged for less than half of the observed time is a concern.
Social Interactions

Overall rates. Overall rates of interactive behavior were within the range observed in previous studies (e.g. Hunt et al., 1996). Rates were similar and fairly low across participants in both types of classrooms (MI = 34.3%, typical = 34.1%). The low rates of interactive behavior are probably related to the significant negative relationships that were found between whole class instructional groupings, non-instructional time, and rate of interaction. Participants in both types of classrooms were involved in either whole class groupings or non-instruction for more than 50% of the observed time. Conversely, activities that were significantly associated with social interactions, including those that involved multiple methods of responding, and small group or one-to-one structures, were experienced less than one-third of the time by participants in both types of classrooms. Thus, because participants frequently experienced environmental factors that negatively affect the likelihood of social interactions, it is not surprising (although it is somewhat disturbing) to find rates of interaction below 35%.

Participants in MI classrooms were more often observed to be involved in grouping structures and the types of activities associated with social interaction, thus a higher rate of social interaction was predicted for participants in MI classrooms. However, it is possible that the relatively high frequency of separate one-to-one, student-classroom assistant activities that are, by definition, interactive may be responsible for the increased interaction rate of participants in typical classrooms (i.e. equaling that of participants in MI classrooms).

Interestingly, the “no instruction” condition was significantly negatively associated with interactive behavior, a finding that is somewhat surprising given that one might expect students to “chat” more during non-instructional time than during “work” time. This finding supports previous research indicating a need for structured activities that promote social
interactions for students with developmental disabilities, particularly activities that allow for multiple methods of responding, since such activities were specifically associated with peer interactions (Janney & Snell, 1996; Salisbury et al., 1995).

Interactive partners. Participants in MI classrooms had a higher mean rate of peer interactions (14.3%) than did participants in typical classrooms (10.3%). In contrast, participants in typical classrooms had a higher mean rate of adult interactions (23.8%) than did participants in MI classrooms (20%). Previous research has suggested that small group structures promote interactions with peers as they work co-operatively on instructional activities (McDonnell, 1998). This was confirmed by the results on this study, in which small group and independent structures were significantly associated with peer interactions. In contrast, one-to-one groupings, which usually involve a classroom assistant or resource teacher, were significantly associated with adult interactions. Thus, the higher rates of small group and independent structures observed for participants in MI classrooms, and the greater prevalence of one-to-one groupings observed for participants in typical classrooms, appear to account for at least some of the difference found with regard to the interactive partners with whom the target students were engaged. Given the substantial body of literature delineating positive effects when students with developmental disabilities interact with typical peers (Brinker & Thorse, 1984; Cole & Meyer, 1991; Fryxell & Kennedy, 1995; Hunt et al., 1994), this finding has some clinical significance, despite its small size.

It is important to note that participants in both typical and MI classrooms spent more time interacting with adults than with their peers, although the ratio was different. However, the finding that participants with developmental disabilities spent less than 15% of their time interacting with peers raises concerns for these participants social and academic development.
Individual differences. All participants spent less than half of the observed time interacting with others. The two participants with the lowest interaction rates were a matched pair (i.e. one was in each type of classroom). Both were male, in intermediate classrooms, diagnosed with PDD, and received ESL supports. It is possible that the communication barriers created by these participants’ second language status and the fact that they had communication disorders related to their PDD may have interfered with their interactive behavior. Thus demographic factors, in addition to environmental variables, may effect interaction rates.

Summary

Research has demonstrated that specific instructional contexts, techniques, and service delivery models promote positive social and academic outcomes for students with and without disabilities (Fisher et al., 1995; King-Sears, 1997). It has been suggested that MI theory provides a framework that includes many of these inclusive pedagogies and techniques (Armstrong, 1994; Hoerr, 1996). The present study was intended to explore the extent to which MI theory and instruction facilitated the inclusion of participants with developmental disabilities.

The experiences of the participants in both typical and MI classrooms were more alike than different. Participants in both types of inclusive classrooms were assigned primarily whole-class or independent seatwork and paper-and-pencil activities, with few small group structures or multiple response activities. However, small differences in the rates of small group, multiple response activities, and non-instructional time were evident across the two types of classrooms. Perhaps the most clinically significant finding was the amount of time participants in typical classrooms spent in separate activities from their peers or with no
instruction at all. This may account for the lower rates of peer social interactions and active engagement behaviors on the part of these participants.

In total, differences in the experiences of the participants in the two types of classrooms were subtle, but when pieced together, paint a picture of a more inclusive experience for participants in the target MI classrooms. Participants in MI classrooms appeared to be more involved in the social and academic life of the classroom, as they spent a greater amount of time interacting with their typical peers, being involved in the same tasks as these peers, and being actively engaged in their learning. This appears to have been related to the presence of more opportunities to engage in activities that allowed for multiple modes of responding and small group activities. However, it is clear that there is still room for improvement, since even the MI participants experienced unexpectedly low rates of multiple response activities and small group activities, and thus displayed disappointingly low rates of social interactions and engaged behavior.

Limitations of the Study

The primary limitation of this study is the small sample size and the limited number of classrooms and schools in which they were housed. The study involved only five participants in each of the two types of classrooms, for a total of ten subjects. Four inclusive classrooms of each type (i.e., MI and typical) were observed, since one classroom in each group included two participants, for a total of only eight classrooms. Two different schools housed the MI classrooms, but only one school was used for the typical classrooms. Because of these combined factors, caution must be taken with regard to generalizing the results to students with developmental disabilities and/or MI and typical inclusive classrooms in general. In addition, the teachers and administrators in one of the schools that incorporated MI practices
had several years of experience with this model, while those in the other school were much newer to MI and had not implemented it as a school-wide initiative. The impact of this variability is unclear. Finally, as is the case in most educational research in natural settings, students were not randomly assigned to classrooms; thus, replication with a larger subject pool is necessary to explore the generalizability of the results.

In addition to the above, it is important to note that this study took place in a single suburban school district in Canada. This district has a somewhat unique cultural make-up, with very high levels of new immigrants, primarily from the Pacific Rim. Students for whom English was a second language ranged from between 22% and 65% in the target schools, and the impact of this variable on the results of the study are unknown. For example, the proportion of such students may have influenced teachers’ selection of grouping structures and activity types beyond the influence exerted by the pedagogical philosophy they embraced.

Future Research

Future research is required to replicate the findings of this study on a larger scale, as well as to explore certain details within the findings. First, determining the reasons for the larger amounts of non-instructional time and separate activities experienced by participants in the typical classrooms is important, in order to find ways to better include these students in the social and academic life of these classrooms. In addition, in the present study, non-instructional time was coded when students were in transition and when no tasks were assigned to them. In future research, it would be interesting to separate these two variables and code them separately, in order to determine the origins of non-instructional time, since the steps that would be taken to reduce its frequency would vary, depending on the source.
As well, the specific determinants and philosophy behind participants in typical classrooms being assigned separate activities is worthy of exploration. When are students assigned separate activities, and what types of activities are they related to (e.g. occur more when the rest of the class is assigned paper-and-pencil, or?)? This would allow researchers to make recommendations regarding instructional tasks or structures that are more inclusive in nature and do not require such modifications.

Second, are the differences in the amount of small group and multiple response activities consistent, and why do some participants in the same classroom have substantially different rates of these experiences? Is this a product of individualized instruction, or of chance observational inconsistency (i.e. one participant just happened to be observed during a particular project which involved these structures, etc.)?

No statistical interaction measures were taken, and these might also have provided further insight into the relationship between task, instructional groupings, and students’ response behaviors. For instance, was there a difference in target students’ behavior when they were placed in small groups with paper-and-pencil tasks, versus in small groups with activities that allowed for multiple methods of responding? Future studies exploring such relationships might provide guidance to educators regarding the types of instructional techniques that support the inclusion of students with developmental disabilities.

Past research has documented a powerful relationship between opportunities to interact with peers, opportunities to engage in multiple response activities, and positive social and academic outcomes for students with developmental disabilities. Such outcomes include social skills development, development of friendship and support networks, academic skills development, and improved behavior (Cole & Meyer, 1991; Fryxell & Kennedy, 1995; Lee &
Odom, 1996). Participants with developmental disabilities in this study who were included in MI classrooms spent more time interacting with peers, and had more opportunities to participate in multiple response activities than did participants in typical classrooms. In future studies, it would be interesting to determine whether these differences were large enough to have a clinically significant impact on students’ social and academic development over time. This would provide further evidence regarding the ability of various pedagogical approaches to provide an educational framework that facilitates the successful inclusion of students’ with developmental disabilities.
References


Teele, S. (1996). Redesigning the educational system to enable all students to succeed. NASSP Bulletin, 80(583), 1-7.


## Appendix A

### Dependent Variable Codes

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Appendix B

Operational Definitions

Engaged Behavior

To simplify both the coding and statistical analysis of engaged behavior, the categories of academic responses, task management responses, and competing responses in MS-CISSAR will be merged to form 3 composite codes that indicate active, passive, and non-engaged behavior.

1. Active engagement will be coded using the MS-CISSAR code “TSKPARTIC.” This will be used as a composite code to operationally define active engagement as “the active participation (e.g. involving a motor or verbal response) of target students in classroom activities.” This definition includes behaviors such as writing, reading, talking, raising a hand, manipulating materials (e.g. math manipulatives, playing a board game), etc.

2. Passive engagement will be coded using the MS-CISSAR code “RDSILENT,” which was redefined as “SILENT” participation. This will be used as a composite code to operationally define passive engagement as “the passive participation of target students in classroom activities through listening or observing silently.” This definition requires that students demonstrate attention by looking at the speaker or object (such as an overhead, film, etc.) being presented.

3. Non-engagement will be coded using the MS-CISSAR code “NOACARSP.” This will be used as a composite code to operationally define non-engagement as “the non-participation or the demonstration of competing responses (i.e.
off-task behavior) of target students in classroom activities.” This definition includes competing responses such as looking around, disruptive/aggressive behavior, talking inappropriately, playing with objects inappropriately, self-stimulatory behavior and self-abuse, etc.

Social Interactions

To simplify both the coding and statistical analysis of social interactions, the codes and definitions within the teacher behavior category in MS-CISSAR will be merged to form 2 composite codes that indicate interactive and non-interactive behavior.

4. Interactive behavior will be coded using the MS-CISSAR code “TALKACA.” This will be used as a composite code to operationally define a social interaction as “attempts by the target student to initiate, attend to, or respond to verbal or nonverbal communications with other students or adults in their classrooms.” This definition includes asking / answering questions, discussing, listening, reading with/to, playing with, singing, etc. Listening within a one to one or small group discussion will be coded as an interaction, however, listening to a teacher lecture will not be considered a social interaction. The category of teacher behavior was redefined to reflect student rather than teacher behavior.

5. Non-interactive behavior will be coded using the MS-CISSAR code “NORESPONS.” This will be used as a composite code to operationally define non-interactive behavior as “intervals in which target students were not attempting to initiate, attend to, or respond to verbal or nonverbal communications to/from other students or adults in their classrooms.”
Interactive Partner

The teacher definition category within MS-CISSAR will be used to identify with whom the target child is interacting. Adult interactants (e.g., teacher, paraprofessional, etc.) will be coded using the MS-CISSAR code “REGULAR.” This will be used as a composite code to identify all adults with whom target students interacted.

Peers will be coded using the MS-CISSAR code “PEERTUTOR,” defined as “a peer with or without disabilities with whom the target student interacts.”

When students are not interacting, the MS-CISSAR code "NO STAFF" will be used to indicate that the target student is not interacting with anyone at that time.

Type of Activity

The “task” category within MS-CISSAR will be used to identify the type of activity in which target students engage.

1. Rote paper-and-pencil tasks will be coded using the "PAPER&PEN" code, defined as “tasks that involve traditional lecture, literacy, and/or paper-and-pencil response activities. These tasks are based primarily on verbal/linguistic and logical/mathematical intelligences.” This definition includes the use of readers, textbooks, workbooks / worksheets, copying notes, handwriting/printing practice, math drill, listening to a lecture, etc.

2. Multiple intelligences activities (multisensory, multiple response options, hands-on, an/or co-operative activities) will be coded using the "OTHMEDIA" code, defined as “activities which use/allow multiple methods of instruction or responding. These activities involve a variety of intelligences other than just verbal/linguistic or logical/mathematical intelligences,
including body/kinesthetic (hands-on), musical, visual/spatial (e.g. artistic/constructive), interpersonal (social/co-operative), etc."

3. When no academic activity is taking place, the MS-CISSAR code "NOTASK" will be used, defined as "intervals in which target students are not assigned to an activity."

Instructional Groupings

Separate activities. In order to determine whether the target students are engaged in the same activity as their peers without disabilities, the MS-CISSAR codes and definitions for "instructional groupings" will be used. Note: definitions of one-on-one and independent instruction were adapted to more clearly differentiate between independent seatwork, in which all students in the class are engaged in the same activity but working alone; and one-to-one instruction, in which a target student is isolated from the rest of the class, which is engaged in a different activity. To determine when target students are engaged in the same activity as their peers the adapted MS-CISSAR codes for "WHOLECLSS", "SMALLGRP", and "INDEPENDENT" will be combined for statistical analysis.

1. "WHOLECLSS" - whole class instruction is recorded when the target student is receiving the same instruction as all other students. Examples include all students listening to the teacher lecture (same task) or the teacher calling out spelling words for a spelling test which involves the entire class.

2. "SMALLGRP" - small group instruction is recorded when the target student is receiving the same instruction as at least one other student but not all students in the class. Examples of small group instruction include reading groups where
students share a common activity but different tasks or levels of task and have
different instructions about what they are to do. Another example is when groups
are located at work or interest stations in the room, each of which is devoted to a
different activity, with different tasks, and different instructions about what to do.

3. "INDEPENDENT"- independent instruction is recorded when the target subject is
engaged in an activity and task which is self-determined and self-managed. This
is often described as independent seatwork. This is coded only when all or most
of the students within the classroom are also engaged in independent seatwork.
Target students may also receive instruction on a one to one basis from and adults
or peer as long as the activity on which they are working is the same as that which
their peers are engaged in.

To determine when target students are not engaged in the same activity as their
peers without disabilities, the adapted MS-CISSAR codes for “ONEONONE” and
“NOINSTRCT” will be combined for statistical analysis.

1. "ONEONONE" - one-to-one instruction is defined when the target student is
working alone with a teacher, aide, or other adult, or alone on an activity which is
different from that in which the rest of the class are engaged.

2. "NOINSTRCT" - no instruction is coded if there is no task, and the student is
receiving no direct questions, commands, or talk from the teacher or a peer.

Instructional grouping. The above codes will also be used to indicate the
instructional groupings (individual, small group, or whole class) in which students are
placed.