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THESIS

*An Examination of the Role of the Multiple Intelligences in Studies of Effective Teaching*

by

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In partial fulfillment for the requirements for the degree of Master of Education  
(Curriculum Studies)

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## *Abstract*

*The purpose of this study is to evaluate selected teacher effectiveness research for elements of multiple intelligence (MI) theory. In order to acquire a more holistic picture of the nature of effective teaching, this study explores teacher effectiveness research through a MI framework in the effort to create a better understanding of effective teaching practices. The importance of this research to teachers lies in its attention to how effective teaching is defined and how effective teaching can be better understood. This research also directs focus on a greater awareness of the role of the teacher, especially when jurisdictions are demanding serious evaluations and examinations of teachers' work.*

*The results indicate a large discrepancy between the intelligences and their representation in teacher effectiveness research. Interpretation of the numbers reveals that there is no clear balance in what is being measured or in what has emerged as themes in teacher effectiveness research. The study also indicates future directions for advancing MI theory into the educational system.*

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## CHAPTER I. INTRODUCTION

*Researchers for nearly a century have attempted to study and create measures of teacher effectiveness, exploring both internal constructs and external behaviours of teachers, including teacher characteristics (Ryans, 1960; Symonds, 1955) and personality traits (Coopersmith, 1967), as well as their observable, classroom behaviour (Rosenshine & Furst, 1973; Soar & Soar, 1976; Stallings, 1976). The question of what effective teachers do has been a topic of discussion for educational researchers and practitioners, but does research link teacher effectiveness directly to the theory of multiple intelligences?*

*Teachers are the key to successful learning in the classroom (Lortie, 1975; Lightfoot, 1983; Goodlad, 1984; Lieberman & Miller, 1984; Wiggenton, 1985; Carnegie Forum on Education and the Economy, 1986; Evertson, 1986; Joyce & Weil, 1986; Zumwalt, 1986; Henson, 1988; Levine, 1989; Hofmeister & Lubke, 1990). Researchers acknowledge that “teaching is complex, demanding, and uniquely human” (Clark & Peterson, 1986, p. 293), and that “what makes a good teacher is a highly personal matter having to do with the teacher’s personal system of beliefs” (Combs, 1982, p.3). In order to reach the spectrum of different learners, good teachers are able to prepare lessons that help all learners understand the material.*

*The issue of effective teaching practices has been a focus of educational researchers. The effective schools research has identified specific teaching behaviours associated with increased student achievement (Brophy and Good, 1986). This literature suggests teachers can be more effective if they change elements of their behaviour in their classrooms. Other*

researchers suggest changes in the teaching culture. Teachers operate under multiple constraints which impact learning in the classroom (Lortie, 1975; Cusick, 1983; Sizer, 1984; Jackson, 1986; Silvermail, 1986, Calderhead, 1987; Sizer, 1987; Bacharach, 1990). These constraints include larger class sizes, inadequate planning and conferencing time; and administrative impediments such as excessive paperwork, interruptions, and headstrong students (Cusick, 1983; Goodlad, 1984; Grant, 1988).

Standardized test scores were once the sole standard for defining successful learning and teacher effectiveness (Worthen, 1993). But successful teaching and learning is a complex matter that involves more than academic achievement. Today's emphasis on higher-level thinking (cognitive) skills as well as equal-quality education for all learners, forges a new model of teaching effectiveness (Wood, 1992). Today, "We want our classrooms to be just and caring" (Greene, 1993). Consequently, researchers are in the process of using knowledge from other disciplines such as psychology and sociology and divergent research methods to examine forerunners which lead to successful learning. They are paying closer attention to teachers' attitudes and beliefs and the effects of these beliefs on students and on the quality of school life (Lunenburg & Schmidt, 1989). Attention to multiple intelligences is becoming an acceptable and important part of the teachers' task. Is this acceptance being reflected in the assessment and analysis of teacher effectiveness?

#### *Purpose of the Study*

In this study, the researcher's aim is to analyze and chart selected areas of effective teacher research in light of multiple intelligences (MI) theory (Gardner, 1983). The researcher

*will examine the role of MI in relation to studies of teacher effectiveness. This fit will be appraised through an analysis of teacher effectiveness literature viewed through a framework which provides a multiple intelligence theory lens of MI teacher qualities and instructional techniques [see Table 3].*

*The purposes of this thesis are (a) to provide an overview of the teacher effectiveness research, (b) to review multiple intelligences theory, c) to identify methods by which teacher effectiveness is measured, d) to examine the extent to which the teacher effectiveness literature has applied elements of multiple intelligences theory, and (e) to identify possible areas in which there are appropriate connections between teacher effectiveness research and multiple intelligence theory.*

#### *Rationale and Significance of the Study*

*The teacher is the deliverer of curriculum in the educational system. Research which provides an understanding of teacher characteristics related to good teaching practice is an essential area of educational research. A greater understanding of the characteristics and components of effective instructional and daily relational practices with students is essential for developing curriculum that reflects the development of multiple intelligences and which fosters the full growth of students in intellect, skills, and value development.*

*One key element of change would involve altering the role of the teacher. Governments are holding teachers more accountable. They are creating governing bodies to provide input into teacher certification (for example, Ontario's College of Teachers) and are developing and implementing standardized tests of teacher and student achievement. Teacher effectiveness*

*continues to be a prevalent issue. Yet, in spite of years of relentless and divergent probing, researchers have not been able to uncover objective criteria with which to measure effective teaching.*

*Identifying the MI dimensions will help to direct future studies on teacher effectiveness to address salient areas that have not been addressed in previous studies. The set of factors identified here will serve as a catalyst for discussion as to how teachers can become more effective in their classrooms by utilizing MI theory. This study also provides a comprehensive examination of what it means to be an effective teacher, and allows teachers the opportunity to identify alternative acceptable ways in which to evaluate, assess and make accommodation for the needs of their students.*

#### *Definition of Terms*

*Teacher Effectiveness - “a combination of the best of human relations, intuition, sound judgment, knowledge of subject matter, and knowledge of how people learn - all in one simultaneous act” (Kauchak & Eggen, 1989, pp. 3-4).*

*. Multiple Intelligence Theory - “a biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture - these potentials are represented in varying degrees by the following eight intelligences: verbal-linguistic, logical-mathematical, bodily-kinesthetic, rhythmic-musical, visual-spatial, naturalist, interpersonal and intrapersonal” (Gardner, 1999, pp. 33-34).*

## CHAPTER II. METHODOLOGY

*The purpose of this study is to evaluate teacher effectiveness research through a multiple intelligence (MI) theory lens. In order to acquire a more holistic picture of the nature of effective teaching, this study explores the elements of MI that are being represented in current research on teacher effectiveness. The framework of this study is in the domain area of knowledge of teacher effectiveness. The question of how best to organize an understanding of effective teaching methodologies is analyzed through a MI filter to see what's out there in the teacher effectiveness literature and to recommend how it can be improved. This study utilizes MI theory in the context of teacher effectiveness and examines the influences and extent of MI theory elements in teacher effectiveness research. The importance of this research to teachers lies in its attention to how effective teaching is defined and how effective teaching can be better understood. This research also directs focus to a greater awareness of the role of the teacher, especially when jurisdictions are demanding serious evaluations and examinations of teachers' work.*

### Research Design

*Twelve studies on teacher effectiveness were examined for their MI elements. The descriptors of the study used to look for MI theory components in teacher effectiveness research were (a) MI Instructional Techniques, and (b) MI Teacher Qualities. The measures and themes in the twelve studies were compared to these descriptors ("MI Instructional Techniques & Teacher Qualities Chart") [see Table 3] in order to designate what intelligence was being*

represented in the study and in what area. The “MI Instructional Techniques and Teacher Qualities Chart” adapted the “How to Teach to the Eight Intelligences” and “Multiple Intelligences Subcapacities” charts (Georg, 1997) to form the assessment tool utilized by the researcher to look for MI elements in teacher effectiveness research. Table 3 was used as the criteria to measure MI instructional techniques and teacher qualities in the twelve studies on teacher effectiveness research. Table 5 shows how the intelligences are represented in the measures and/or themes in the teacher effectiveness studies.

The researcher is confident that the twelve studies selected are a valid representation of the research on current teacher effectiveness. The twelve studies were selected because they represent the varying degrees of research designs and methodologies in teacher effectiveness literature. The criteria used to select the twelve studies was the different usages of research methodologies. After the twelve different research designs were noted, a redundancy of research methodologies in teacher effectiveness literature became evident. Saturation of same-style methodologies was clear after the twelve methodologies were distinguished. Therefore, the researcher selected the twelve studies based on the variance of methodologies used. The diversity of research methodologies is commented on underneath and the full account of the twelve studies on teacher effectiveness is provided in Table 4.

The twelve studies were categorized by the researcher into the following headings: Study, Research Methods, School Level, Intelligences, and Measures/Themes. From this information, a chart was created that surveys effective teaching research as it relates to MI theory. Each of the headings is explained below:



Study: provides the name of the authors and the date of publication. In order to maintain a current focus, only those studies having a publication date of 1985 to 1998 were selected. In addition, the studies have been alphabetically organized.

Research Methods: consists of the methodology the researchers used in their study to examine teacher effectiveness. This includes one of the following: process-product, student evaluations, teacher self evaluations, teacher evaluations of effective teaching, principal evaluations of teachers, interviews, ethnography, or a combination of any of these.

School Level: refers to the educational institution where the study took place. This includes: elementary (J.K. to grade 5), middle (grade 6 to grade 8), secondary (grade 9 to OAC), university (1st year students ranging to adult learners attending university), or a combination of any of these.

Intelligences: represents the type of intelligence the study in question is making use of (based on Gardner's theory of multiple intelligences). The listed intelligence consists of one of the following multiple intelligences: verbal-linguistic, logical-mathematical, bodily-kinesthetic, visual-spatial, personal (both intra and inter), naturalist, or any combination of these.

Measures/Themes: contains the elements that were studied or emerged from being studied in the research on teacher effectiveness. To differentiate between instructional techniques and teacher characteristics that were measures or themes in the studies, teacher characteristics have been italicized.

### Instrumentation

The challenge for the researcher was to establish a way to evaluate existing literature on teacher effectiveness that encompasses the essential elements of multiple intelligence theory. The researcher has merged the “How to Teach to the Eight Intelligences” and “Multiple Intelligences Subcapacities” charts (Georg, 1997) to create the “MI Instructional Techniques & Teacher Qualities Chart” to help assess the existing MI themes and measures of teacher effectiveness research [see Table 3]. Twelve selected studies were analyzed for their representation of MI in either instructional techniques or teacher qualities, then these themes and measures were categorized into one of the following eight intelligences:

1. Verbal-Linguistic
2. Logical-Mathematical
3. Visual-Spatial
4. Bodily-Kinesthetic
5. Rhythmic-Musical
6. Interpersonal
7. Intrapersonal
8. Naturalist

Only the themes and measures that were applicable to MI theory were categorized in the study.

### Limitations of the Study

In conducting this research, the researcher looked for universal teacher qualities and instructional techniques based on MI theory. A possible limitation could be the instrument used to analyze the studies. The subcategories of instructional techniques and teacher qualities might be limiting in itself in attempting to look for effective teacher elements. In such a pioneering area of research, it could be possible that other important teacher elements have not

*been included in surveying teacher effectiveness research.*

## CHAPTER III: TEACHER EFFECTIVENESS RESEARCH & MI THEORY

### Teacher Effectiveness Research

*The relevant selected literature that provides a background for this study comes from several strands including: (a) the teacher and school reform movements; (b) teacher effectiveness research; and (c) multiple intelligence theory. Educational reform cannot be conducted without an examination of the role teachers play. In this research, the literature from existing studies becomes the data base for analysis. A comprehensive review of selected studies comparing rating tools, research methodology, and teacher characteristics is analyzed and discussed. Then, multiple intelligence theory is reviewed with emphasis pointing towards relating the theory to future teacher effectiveness research.*

### *The Effective Teacher Literature*

*Effective teacher literature focuses on the arguments surrounding the definition of effective teaching practices and the essential characteristics associated with teachers who produce greater achievement gains in their students than most other teachers. Under the headings of process-product research, student evaluation studies and qualitative research meta-analysis, each of these themes is presented in greater detail followed by a summary of the findings.*

### *Process-Product Research*

*A major focus of teacher effectiveness research stems from studies conducted on process-product research. Such research focuses on studying the relationship between teacher behaviours (process) and student achievement (product) in the hope of determining what*

teacher behaviours would lead to increased student achievement (Peterson, 1979). The validation process involves at least three stages: (a) the description of selected teaching/instructional activities; (b) the correlation of this description with some measure of student growth; and (c) experimental studies which test the derived variables from correlational studies to determine if they were causative agents of student change (Borich & Fenton, 1977; Smith, Peterson, Micceri, 1987; Burrell, 1994).

Studies in process-product research focus on the consequences of teachers' actions on student learning as measured by standardized achievement tests. (Grant, 1991) Process-product research findings reinforce many of the beliefs already held by teachers. Common characteristics of this research include the following:

1. Research is conducted in naturalistic school settings with normal populations.
2. Most studies are conducted for a complete school year.
3. The relationship between the process of instruction and its effects on students is emphasized. Although predicting variables (teacher intelligence, leadership, enthusiasm, self-concept) and context variables (age, sex, ability level of students, subject matter, type of school) are often included, they are not emphasized.
4. The teacher is the unit of investigation. Focus rests on the instructor's function only. Curricular and technological concerns are not studied.
5. Teacher effect on student achievement is measured by residual gain scores on standardized instruments. Attitude may be measured, but only in relation to achievement gains.
6. Low-inference, objective instruments are used to observe and record teacher behaviours.

Such instruments allow the observer to tally events rather than assess the quality of observed activities.

Brophy and Good (1986) point out that under the above context, "teacher effectiveness" is, in fact, a matter of definition. To equate teacher effectiveness with gain on achievement tests only, is a misconception:

Most definitions (of teacher effectiveness) include success in socializing students and promoting their affective and personal development in addition to success in fostering their mastery of formal curricula. (p. 328)

#### Limitations of Process-Product Research

The debate regarding process (teaching style) and product (student outcomes) is an on-going issue in research and is not without its critics. A major concern is the use of standardized achievement tests as the measure of student learning. Although appropriate for comparing scores to provincial or national norms, such tests lack content validity at the classroom level (Berliner, 1976) and may be culturally biased as well.

Some suggest that student learning expectations are the ultimate criterion (McKeachie, et al, 1980). Even as noted by Saadeh (1970), when using student learning solely as a measure of teacher effectiveness, one must be aware that as situations become more complex (ie variances in learning styles, socio-economic background, etc.), the value of student learning as a measure of teacher effectiveness, becomes harder to assess. It is important to note that it is not an argument against student learning as a measure of teacher effectiveness, but rather, as noted by Stroh (1986), focusing on one variable in a complex situation is fruitless and

*researchers are better to concern themselves “with the whole situation in order to be able to define teaching effectiveness in terms of its effects.” (p. 78).*

*Another area of concern regarding process-product research is the cost factor. To carry out such research, many teachers, trained observers and school districts must be willing to participate and cooperate.*

*A measurement problem arises when affective goals and student socialization outcomes are added to the definition of an effective teacher. Effective student outcomes are not usually measured using objective methods of assessment which leaves the teachers’ opinion as the primary source of student evaluation. Studies indicate that teachers’ opinions do not tend to be a reliable measurement instrument to assess student progress (Ebel and Frisbie, 1986).*

*This research also has procedural limitations. The design calls for atomistic teacher behaviours to be tallied and aggregated from many classes throughout the school year. While such data collection is effective for a universal analysis, the intent of teacher behaviours or the context in which the behaviours took place may not be identified accurately (Shulman, 1992). Teachers adept at behaviourist tasks or “comfortable teaching facts and skills” (Ornstein, 1995) tend to be favoured in the evaluation instruments, since the instruments tend to focus on small segments of observable or measurable behaviours, and the tests that measure student learning expectations stem from knowledge-based items.*

*A teacher who stresses abstract or divergent thinking, humanistic or moral practices, is discriminated against (and still is) as these are hard-to-measure processes which, as a result, are ignored by most evaluation instruments. (Ornstein, 1995)*

*Finally, teaching is a complex occupation that cannot be distilled into a formula for success. Students, schools, class settings, government regulations, and other variables affecting the teachers interaction constantly can not be reflected by a set of standardized instruments.*

### Findings

*In spite of these short comings of the methodology, researchers have attempted to identify the common characteristics and practical experiences of teachers and teacher educators which are supported by process-product research results. The significance of this research lies in the congruence of findings across diverse settings, subject matter, age groups and ability levels. Process-product research does suggest that teachers make a difference in the learning levels of their students, and that certain observable teaching behaviours affect student achievement positively.*

*In a summary of the teacher effectiveness research findings, Porter and Brophy (1988) found that effective teachers are semi-autonomous professionals who:*

- \* are knowledgeable in content and teaching strategies;*
- \* are knowledgeable about their students and their instructional needs;*
- \* are clear about their instructional goals;*
- \* communicate expectations to their students;*
- \* teach for metacognition;*
- \* address high, as well as low, level cognitive learning expectations;*
- \* monitor student understanding and offer appropriate feedback;*



- \* *make expert use of existing instructional materials to enrich and clarify the content;*
- \* *integrate their instruction with other subject areas;*
- \* *accept responsibility for student outcomes;*
- \* *are thoughtful and reflective about teaching.*

*Brophy and Good (1986) identified two broad themes which recur throughout the research in general: (a) "academic learning is influenced by amount of the time that students spend engaged in appropriate academic tasks"; and (b) "students learn more efficiently when their teachers first structure information for them and help them relate it to what they already know, and then monitor their performance and provide correct feedback during recitation, drill, practice, or application activities" (p. 366).*

*The findings of process-product research have been used for preservice and inservice instructional improvement. Explicit teaching, or direct instruction, is an example of bridging research to practice (Rosenshine, 1983).*

#### *Student Evaluation Studies*

*In student evaluations, perceptions of learning and relationships are intertwined in measuring teacher effectiveness. Shepherd, et al. (1989) maintains that students do not distinguish between the two concepts which he calls 'task' (assessment of student learning that takes place in the classroom) and 'relational' (teacher/student relationships) when they evaluate their teachers. As a result, according to this study, teachers can assure high marks from their students if they are perceived as open, friendly, approachable, relaxed, and so on, regardless of whether the students were taught anything.*

*Other researchers believe students can and do make such distinctions in their evaluations. The true relationships among student learning, teacher/student relationship concerns, and student evaluations of teacher effectiveness are complex and dependent on a number of factors including teacher characteristics, class content, timing of the evaluation, and perhaps most obviously, individual differences in student evaluators (Powell & Arthur, 1982, 1985).*

*Further questions concerning student evaluations of teacher effectiveness include different kinds of classes (classroom contexts). These include class size, expected grade, course level, and initial student interest in the subject matter. Marsh (1987) estimates that 12-14 percent of these between-teacher variables in mean overall effectiveness ratings typically would be attributed to such factors. The effects of many of these "bias factors" (Koon & Murray, 1995) are controlled or attenuated in multisection validity studies (for example, the course level is the same for all sections, and class size may be similar). Those that are not controlled, either by multisectionality or by random assignment of student classes, will appear as unexplained between-teacher variance in the overall effectiveness ratings. (Koon & Murray, 1995).*

*The student evaluation literature of what students consider effective teachers is immense and definitely quantitative and empirical in nature. The use of student evaluations is a subject of debate. The question is not whether or not students are qualified to judge teacher effectiveness, rather, are students as qualified to judge teacher effectiveness as professionals themselves? (Stroh, 1986). According to Marsh (1987), "Nearly all researchers argue strongly that it is absolutely necessary to have multiple indicators of effective teaching whenever the*

*evaluation of teaching effectiveness is to be used” (cited in Koon & Murray p.62). Research needs to focus not just on objectively tested learning gains, but on the summative extent to which a variety of measures of student outcomes can explain variances in student evaluations in the mean overall teaching effectiveness ratings.*

#### *Qualitative Research Meta-Analysis*

*Unfolding in the 1990s, research on teacher effectiveness is branching into a more qualitative arena. Qualitative research design is based on field-based methods - conversations, interviews, and ethnographies of one, two, or a few subjects - usually written in a narrative form. According to Peshkin (1993), the qualitative research deals with descriptions of people and situations, explanations of knowledge and behaviour, interpretations of theories and assumptions, and evaluation of practices and policies.*

*Eisner (1985) believes teaching is an art and the primary objective of an effective teacher is to lead the class toward the objectives of the lesson while constantly adjusting and allowing the students to participate in the lesson whenever their talents and interests will allow them to engage in the lessons. He compares teaching to basketball where there are certain rules you must follow to engage in the activity of scoring points; however, the goals of teaching do not remain constant. The goals of teaching change; they are not without ambiguity, and they are certainly not the same for all students.*

*Another proponent of qualitative research in teacher effectiveness, Allan Ornstein states that instead of dealing with statistically-based categories and verifiable data, qualitative research in the area of teacher effectiveness lends itself to providing narratives and*

portrayals which are highly personal and morally persuasive (1995). Ornstein feels that more humanistic or value-based teachers will benefit from qualitative research because it describes what teaching is about from personal and social aspects.

*It (qualitative research) is viewed by feminist educators as a means of undercutting the dominant position of male researchers by deemphasizing mathematical and symbolic skills (a male form of knowing) and elevating verbal skills and literary prose (in which females have usually excelled). It is viewed by the political left. . . as a means of reducing the influence of traditional researchers who they often label "technocratic," overly rational or behaviourist, and politically biased or conservative. It is viewed by practitioners in general as a means for exposing the rhetoric of theoretical posturing, or at least reversing some of the previous silence teachers have had to endure because they were unable to understand the research and theoretical aspects of teaching. (Ornstein, p. 5)*

*The most common method of qualitative research conducted in research on teacher effectiveness is the interview. Interviews have been used for many years to help participants recall and examine their thoughts and feelings about a host of topics. In eliciting a teacher's personal or practical knowledge through interviews, patterns of teacher thinking emerge.*

*Open-ended discussions have been used in recent research to explore in depth the meaning by which teachers acquire, develop, or use their expertise about teaching and learning and the teacher's personally held systems of principles and values of teaching are made clear (Ornstein, 1995). The interviewer is required to have the interpersonal skills to enable them to help the teacher move from implicitly held and private belief systems to explicit descriptions and to organize a frame of reference that can be used by other teachers (Ornstein, 1995).*

*Although interviews have contributed much to the understanding of teacher thinking and*

knowledge, they are not without problems. They are predicated on the assumption that a teacher can articulate their otherwise tacit knowledge. Interviews assume that what people say accurately represents their thought processes or what they actually do in practice. They presuppose that all participants share the same vocabulary and perceptions and fail to account for the difference between teachers who are often focused on immediate concerns and practical issues, and researchers who are more concerned with general concepts and theoretical issues (Solas, 1992).

Ethnographic research in teacher effectiveness places the least emphasis on analyzing student achievement levels. Ethnographic research has contributed to the study of teacher effectiveness by emphasizing the contextual constraints and rules of everyday classroom life, by stressing the importance of thoughts, feelings, perceptions, and attitudes of classroom participants, and particularly, by calling into question our rational models of human behaviour” (Westbury, 1988, p. 138). Instead of focusing on defining achievement, ethnographic researchers analyze more the “context, conditions, and interactions that lead to achievement” (Westbury, 1988, p. 139). Ethnographers seek to understand the meaning of particular classroom events, unlike researchers in the process-product tradition who look for patterns and predictability.

Some branches of ethnographic research in ethnography include the sociological, anthropological, and linguistic perspectives. For example, ethnographic sociolinguistics emphasizes communication, leading a number of researchers to focus on the coding and qualitative analysis of classroom discourse (Cazden, 1972; Delamont, 1983; Green, 1983).

Frequently, audio and video recordings of classroom life are transcribed to provide qualitative

and quantitative data.

*There are obvious limitations to qualitative research. The time factor is the biggest threat to on-going research on teacher effectiveness using qualitative research. It takes much longer to describe a teacher's performance than to check off prearranged categories. The phenomenological and ethnographic description is based on the observer's judgement, whereas a checklist count is considered more precise. (Westbury, 1988) Furthermore, descriptive, colourful language often influences readers to conclude that the researcher is biased. Without qualitative description, important classroom events may be ignored, but with the description there is suspicion of bias.*

#### Current Trends in Teacher Effectiveness Research

*No research paradigm has an exclusive patent on how to generate knowledge. Process-Product research, with its emphasis on quantitative designs and methods, has traditionally dominated studies of teacher effectiveness. Teacher effectiveness has been defined as "the ability of a classroom teacher to produce higher-than-predicted gains on standardized achievement tests" (Good, 1979). More recent publications on teacher evaluations have expanded this definition to include the humanistic or personal characteristics and behaviours of the teacher as being essential for effective teaching (Curry, 1993; Kondrat, 1989). Especially within the last decade, many interesting and provocative publications are evolving from the qualitative approach, including a broader framework about teacher research which includes phenomenology and ethnography. Such qualitative methodologies in teacher effectiveness research represent new ideas and ways of presenting knowledge about teaching and can perhaps*

widen our knowledge on what it means to be an effective teacher.

*Teacher effectiveness research may require a more holistic analysis of what it means to be an effective teacher. By exploring the issue from a multi-methodological standpoint using a combination of research methods and using multiple methodologies a more comprehensive and balanced understanding of the complex meaning of what it means to be a good teacher might come to fruition. Some of the elements in such research might include the following: teaching styles, teacher qualities or characteristics, behavioural components, instructional techniques, and methods by which teachers facilitate multiple intelligences in their classrooms. In this study, teacher characteristics and instructional techniques in existing teacher effectiveness research are analyzed for elements of multiple intelligences theory.*

### *The History of Intelligence*

*Complex as the issue of teacher effectiveness might be, an equally complex subject is that of the meaning of intelligence. Throughout history, the determination of intelligence has depended on measures of how well individuals function within their environment. The measurement of intelligence did not become firmly entrenched in our thinking until the turn of the century when Alfred Binet (1909 as cited in Terman, 1916) and his colleagues developed a test to predict how well French students would perform in school. This instrument, known as the Binet-Simon Intelligence Scale, provided a relatively efficient method to determine which students would succeed in school and which would need remediation. The original purpose of the test was not the ranking of students, but to provide a valuable curriculum planning tool. It was meant to be helpful for and not critical of students.*

*This concept of measuring intelligence soon reached North America. In 1916 at Stanford University, Lewis Terman (1916) revised the Binet-Simon Scale to make the test more applicable to American society, and to address deficiencies he perceived in the test. These deficiencies included: a) ceiling and floor constrictions, and b) instability of scores over time (Terman, 1916). Terman introduced the term "intelligence quotient" (IQ). The Stanford-Binet Scale, developed by Terman, became widely used in schools for grouping students by ability level and predicting their future educational success. The notion of using intelligence tests as a means by which to rank individuals was thus established, and the measurement of intelligence would play a major role in the education of North American children.*

### *Factor Analytic Intelligence*

*The nature of intelligence is a perplexing issue in the field of cognitive science. The contrasting nature of the views and theories clearly points to the complexity of defining this abstract concept.*

*The factor analytic view of intelligence represents the pervading view of intelligence in the school setting. This view of intelligence is supported by the work of Spearman (1904) who believes that all intelligence comes from one general factor, known as 'g.' The evidence for a single general intelligence is the fact that there is proof of a single general factor that governs the level of intelligence of an individual. This is also known as the positive manifold (Spearman, 1904). Spearman administered different types of tests to many people covering several different areas of cognitive ability. When he examined the results he found that there was a positive correlation between the tests for any given individual. In other words, if a certain person*



performed well on a test of verbal abilities, then that same person performed well on another test of cognitive ability, such as, mathematics. Spearman proposed that intelligence consists of two factors, a general factor or 'g' factor and a cluster of specific factors (Spearman, 1927). This 'g' factor represents the mental ability that underlies performance on all intellectual tasks. Moreover, Spearman contended that the general factor along with one or more specific factors account for an individual's performance on intelligence tests. Jensen (1997) supported the theory of one general intelligence by stating, "the positive correlation between all cognitive test items is a given, an inexorable fact of nature. The all-positive inter item correlation matrix is not an artifact of test construction or item selection, as some test critics mistakenly believe" (p. 223). Though these theorists view intelligence as having more than one dimension, the position is taken that general ability underlies intelligent behaviour.

The use of factor analysis to investigate constructs of intelligence represents one prominent school of thought. Sternberg (1985) notes that the difference in the factorial theories centres on the number of factors proposed by the theory and the geometric arrangement of the factors with one another. The works of Spearman, Thurstone, and Guilford illustrate this viewpoint. Spearman represents the general-factor theory of intelligence; whereas, Thurstone and Guilford postulate that intelligence is a composite of various independent factors. Overall, these theorists adhere to the theory of general intelligence with the belief that intelligence is multidimensional (Sattler, 1992).

### *Rationale for Background on MI Theory*

*For the purposes of this study, it is necessary to explain Howard Gardner's (1983) theory of Multiple Intelligences (MI theory). In order to understand what elements of MI theory are being represented in research on teacher effectiveness, it is central to this thesis to have a thorough explanation of each of Gardner's intelligences. A clearly presented picture of MI theory and MI assessments of students helps to provide focus to the details that are both absent and present in studies on teacher effectiveness and gives emphasis to this thesis' attempt to emphasize MI elements in teacher effectiveness research.*

### *Gardner's Theory of Intelligence*

*Howard Gardner's theory of multiple intelligences (1983) and its application to education has been of growing interest to researchers and educational practitioners. His book, Frames of Mind (1983) has given rise to a new conceptualization of intelligence. Previous views of intelligence had entailed a single, though multifaceted, factor of intelligence labeled 'g.' That some individuals possessed more intelligence than others was an accepted fact and intelligence was viewed as stable, capable of being measured early in life. Until recently, intelligence was viewed as something that was fixed at birth, a result of heredity, and that nothing much could affect the given amount a person could learn. With the development of pluralistic views of intelligence comes the possibility that educators play a pivotal role in developing and building on children's learning.*

*Gardner suggested the existence of multiple intelligences in every normal individual. And by strengthening one's intelligences, he claimed, was the whole purpose of education. Because*

*Gardner situated intelligences in culture and in contexts which proved them useful, he argued against the appropriateness of pencil and paper tests for assessing intelligence. Although these tests conceivably measure 'g,' Gardner challenged their validity as predictors of the ability to solve problems and succeed in real-world situations. Gardner (1993) writes, "I do not deny that 'g' exists; instead, I question its explanatory importance outside the relatively narrow environment of formal schooling" (p. 39). For Gardner, this concept of intelligence seemed to pass by many strikingly talented individuals, and a focus on 'g' appeared biased and unproductive.*

*Gardner (Gardner & Hatch, 1989) defines intelligence as the capacity to solve problems and fashion products that are valued in one or more cultural settings. It might also involve a potential for finding or creating problems (Gardner, 1983). Different intelligences involve distinct forms of psychological processes (Gardner & Hatch, 1989). They act as a "biopsychological potential" for dealing with specific environmental content and can be helpfully understood as procedural knowledge, rather than propositional knowledge. An individual with a high degree of a particular intelligence has no obstacle preventing him or her from using that intelligence when choosing to do so; individuals particularly able to deal with certain kinds of content can be considered "at promise" and may need little formal education to deal with that content. Others may be "at risk" with regard to that content (Gardner, 1983).*

*According to Gardner's original theory of multiple intelligences (MI) theory (1983), each individual possesses seven intelligences: linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, interpersonal, and intrapersonal (Gardner, 1983). While each person possesses all*

*of these intelligences, the degree of ability in each intelligence varies. This variation of abilities produces a unique multiple intelligences profile. Most people have high levels in some areas, moderate in others, and low levels in other areas, but very few people would ever demonstrate a high level or low level ability in all seven areas. Table 1, adapted from Lazear (1991, p. 167), illustrates abilities associated with each of the seven intelligence areas.*

*Gardner (1983) has developed eight criteria by which to judge whether or not a given capacity could be considered an intelligence. These 'signs' are as follows:*

*1. The intellectual capacity demonstrates potential isolation by brain damage. It must be relatively autonomous from other human faculties and localized in the brain. Injury to that part of the brain, then, could impede it, while not affecting other intelligences.*

*2. The capacity must be evidenced in idiot savants, prodigies, and other exceptional individuals. Gardner further argues that to the extent that these conditions can be linked to genetic factors or to specific areas in the brain, the capacity is more persuasively an intelligence.*

*3. An intelligence must possess an operation or set of operations integral to it, that is, a basic information-processing mechanism that can deal with specific types of input. A human intelligence could be viewed as a "neural mechanism or computational system which is genetically programmed to be activated or 'triggered' by certain kinds of internally or externally presented information" (Gardner, 1983, p. 64). Computer simulation of these operations would provide compelling evidence.*

*4. An intelligence must progress along a developmental history that results in a*

*definable set of end-states (1983). It begins with a patterning ability in the first year of life; next, it is encountered through a symbol system. Later, intelligences, along with their symbol systems, are represented in notational systems. Finally, during adolescence and adulthood, the intelligences manifest themselves in vocational or avocational pursuits (Walters & Gardner, 1984).*

*5. An intelligence must also exhibit evolutionary antecedents and plausibility, including capacities shared with other organisms (for example, primate social organization). Gardner stressed the elusiveness of firm facts, however, in regard to this criterion.*

*6. Experimental psychology must support the existence of an intelligence. Such support might take the form of a study of linguistic or spatial processing, or one that focuses on the relative autonomy of an intelligence.*

*7. An intelligence must also receive psychometric support. Though Gardner is highly critical of standardized pencil and paper tests and though interpreting psychometric findings is not always straightforward, they can be used to enhance his theory's credibility. For example, positive correlation between tasks that claim to assess one intelligence and less correlation with those that assess another intelligence can be considered support.*

*8. It must be possible to encode the operations of an intelligence in a symbol system. Symbol systems, such as language, numbers, and musical notation, contribute to the usefulness of an intelligence and might well be a primary characteristic of intelligence in humans (1983).*

### The Eight Intelligences

After delineating these criteria, Gardner proceeds to describe those capacities which have met them; Armstrong provides a summary chart of Gardner's evidence (1994, p. 8). Gardner (1983) initially identified seven intelligences; an eighth (naturalist) was identified later (1993). In *Frames of Mind*, he discusses each of the first seven intelligences in light of his criteria, positing them within the context of one or more individuals exemplifying the intelligence and describing their developmental trajectories and arch-typical end-states. It is interesting to note that most other descriptions of the "core operations" of these intelligences do not follow the order Gardner posed in *Frames of Mind*, though his ordering there intentionally reflects commonalities between certain intelligences. Table 1 adapted from Georg (1997) illustrates the essential attributes associated with each of the eight intelligence areas.

### Verbal-Linguistic Intelligence

Linguistic intelligence (Gardner, 1983, p. 77) refers to an individual's mastery in using language competently for communication and expression and this competence is best exemplified by poets and writers. Armstrong offers a comprehensive definition of the linguistic competence:

The capacity to use words effectively, whether orally (e.g. storyteller, orator, or politician) or in writing (e.g. as a poet, playwright, editor, or journalist). This intelligence includes the ability to manipulate the syntax or structure of language, the phonology or sounds of language, the semantics or meanings of language, and the pragmatic dimensions or practical uses of language. Some of these uses include rhetoric (using language to convince others to take a specific course of action), mnemonics (using language to remember information), explanation (using language to

inform), and metalanguage (using language to talk about itself). (Armstrong, 1994, p2).

While poetry provides us the clearest instances of linguistic skills, everyone exhibits some command of “the linguistic tetrad of phonology, syntax, semantics, and pragmatics” (Gardner, 1983, p. 77). In fact, linguistic competence is the intelligence “that seems most widely and most democratically shared across the human species” (Ibid., p. 78). Gardner singles out four aspects of linguistic knowledge that are widely used in the general populace: first, the rhetorical aspect of language to convince others; secondly, the mnemonic use to maintain information; thirdly, the explanatory role for teaching and learning; and finally, the knowledge of language for metalinguistic analysis; especially valuable for clarifying meaning. (Ibid., p. 78) Human share an immense sensitivity to the meaning of words, the order among words, the sound and inflections of words, and the different functions of words to suit goals and purposes.

Linguistic intelligence is answerable for the composition of language in all its elaborate possibilities in the forms of poetry, humour, reading, syntax, various genres of literature, cerebral reasoning, symbolic analyzing, theoretical patterning, and the written and spoken word (Lazear, 1991, p. 14). Linguistic intelligence is awakened by the spoken word; by reading someone’s ideas or poetry; and by writing one’s own ideas, thoughts, or poetry (Ibid).

### Logical-Mathematical Intelligence

Mathematical intelligence emanates from the manipulating of objects, grows into the ability to think concretely about those objects, then develops into the ability to think formally about relations without objects (Grow, 1995, p. 5). Gardner points out that the mathematicians must be capable of writing their proofs with meticulous accuracy, along with

having the expertise to reason precisely (Ibid., p.6). "The idea of logical-mathematical intelligence directs one's attention to the precision of language and the precision of thought in a piece of writing - whether the sustained structure of a long work, the organization of paragraphs, sentences, or transitions" (Ibid.). Armstrong defines mathematical intelligence as:

*The capacity to use numbers effectively (e.g. as a mathematician, tax accountant, or statistician) and to reason well (e.g., as a scientist, computer programmer, or logician). This intelligence includes sensitivity to logical patterns and relationships, statements and propositions (if-then, cause-effect), functions, and other related abstractions. The kinds of processes used in the service of logical-mathematical intelligence include: categorization, classification, inference, generalization, calculation, and hypothesis testing (Armstrong, 1994, p.2).*

Logical-mathematical ability does not just appear as the ability to do math easily. It also can be demonstrated as a student uses logic to solve a problem in a step-by-step approach. The ability to figure out a variety of solutions to a problem, or coming up with a problem within a problem might also be an indication of strength in this intelligence.

### Visual-Spatial Intelligence

Spatial intelligence refers to the capacity to think visually, orient oneself spatially, see the visual-spatial world clearly, and to execute transformations on one's initial perceptions (Armstrong, 1994, p.6). The spatial competence involves:

*The ability to perceive the visual-spatial world accurately (e.g., as a hunter, scout, or guide) and to perform transformations upon those perceptions (e.g., as an interior decorator, architect, artist, or inventor). The intelligence involves sensitivity to colour, line, shape, form, space, and the relationships that exist between these elements. It includes the capacity to visualize, to graphically represent visual or spatial ideas, and to orient oneself appropriately in a spatial matrix (Armstrong, 1994, p.2).*

*Often referred to as visual-spatial this intelligence involves the ability to*



*understand, perceive, internalize and/or transform space . . . People who have this intelligence often enjoy chess, like many colours, do jigsaw puzzles and can imagine the world from a bird's eye view" (Gaffney, 1995, p. 8).*

*Gardner (1983) states that spatial intelligence involves an array of loosely related skills:*

*"The ability to recognize instances of the same element; the ability to transform or to recognize a transformation of one element into another; the capacity to conjure up mental imagery and then to transform that imagery; the capacity to produce a graphic likeness of spatial information; and the like" (p. 176).*

*These spatial abilities are vitally important in many arenas of life over the world; in orientating oneself on land and ocean; in recognizing object and scenes when some aspect of their original surroundings has been altered or changed; and in working with two or three dimensional depictions of real-life scenes, maps, and diagrams (Gardner, 1983). Gardner goes on to explain two other uses of spatial capacities, the first one being in the area of the arts:*

*Two other uses of spatial capacities prove more abstract and elusive. One involves sensitivity to the various lines of force that enter into a visual or spatial display. I refer here to the feelings of tension, balance, and composition that characterize a painting, a work of sculpture, and many natural elements (like a fire or waterfall) as well. These facets, which contribute to the power of a display, occupy the attention of artists and viewers of the arts. (Gardner, 1983, p. 176)*

*Gardner's (1983) second use of spatial intelligence concerns resemblances that exist between apparently different forms - for example, the metaphorical ability to draw analogies that see the sky as a membrane or mankind as a heap of earth; these kinds of resemblances may well have occurred to one initially in spatial form (p. 176). Even science employs spatial*

metaphors:

*Darwin's tree of life, Freud's unconscious submerged like an iceberg, Dalton's tiny solar system. . . This ability to use mental models and images may then likely play a role in everyday problem-solving (Gardner, 1983, p. 176-177).*

### Bodily-Kinesthetic Intelligence

*Bodily-kinesthetic intelligence requires the adeptness to comprehend the world through body experiences, to express ideas and emotions, and communicate with others physically (Gaffney, 1995, p. 7). This intelligence is strongly evidenced in ballet dancers, entertainers, athletes, sculptors, doctors, tradesmen, and craftspeople (Ibid.). Armstrong describes bodily-kinesthetic intelligence as having:*

*Expertise in using one's whole body to express ideas and feelings (e.g., as an actor, a mime, an athlete, or a dancer) and facility in using one's hands to produce or transform things (e.g., as a craftsperson, sculptor, mechanic, or surgeon). This intelligence includes specific physical skills as coordination, balance, dexterity, strength, flexibility, and speed, as well as proprioceptive, tactile, and haptic capacities. (Armstrong, 1994, p.3)*

*This intelligence often comes to our attention with "children who cannot sit still for long, those who are well coordinated, or those who need to touch things in order to learn" (Gaffney, 1995, p.7).*

*Bodily-kinesthetic intelligence centres around a person's "ability to control one's body movements and to handle objects skillfully (Armstrong, 1994, p.6). Gardner looks at two capacities when he speaks of the cores of bodily-kinesthetic intelligence. They deal with exploiting "gross motor movements" and the ability to carry out tasks involving "fine motor*

movements" (Gardner, 1983, p. 206). These two operations may be carried out separately, "Skill in the use of the body for functional or expressive purposes tends to go hand in hand with skill in the manipulation of objects" (Ibid., p.207).

Concerning all the intelligences, Gardner notes "Nearly all cultural roles exploit more than one intelligence" (Gardner, 1983, p. 207). The overlap of various intelligence with each other has been a critically important aspect with our species for many years, if not millions of years (Gardner, 1983, p. 207).

Gardner notes the Ancient Greeks' reverence for their bodies:

In speaking of masterful use of the body, it is natural to think of the Greeks, and there is a sense in which this form of intelligence reached its apogee in the West during the Classical Era. The Greeks revered the beauty of the human form and, by means of their artistic and athletic activities, sought to develop a body that was perfectly proportioned and graceful in movement, balance, and tone. More generally, they sought a harmony between mind and body, with the mind trained to use the body properly, and the body trained to respond to the expressive powers of the mind (Gardner, 1983, p. 207).

Recent culture has developed a separation between reasoning and physical activity. This divorce between the mind and body has managed to suggest that body activity "is somehow less privileged, less special, than those problem-solving routines carried out chiefly through the use of language, logic, or some other relatively abstract symbolic system" (Gardner, 1983, p. 208). Many cultures do not draw a sharp distinction between the use of the body and other cognitive intellectual powers (Ibid.).

### Musical-Rhythmic Intelligence

*Musical-Rhythmic intelligence includes receptiveness to pitch, timbre, and rhythm and sensitivity to music (Nelson, 1995, p. 26). It also includes such abilities as the cognizance of tonal patterns and rhythm, awareness of sounds such as human, animal, environment sounds, and musical instruments (Lazear, 1991a, p. 15). Armstrong also provides us with some of the capacities that a person with musical intelligence might exhibit:*

*The capacity to perceive (e.g. as a music aficionado), discriminate (e.g., as a music critic), transform (e.g. as a composer), and express (e.g., as a performer) musical forms. This intelligence includes sensitivity to the rhythm, pitch or melody, and timbre or tone colour of a musical piece. One can have a figural or “top-down” understanding of music (global, intuitive), a formal or “bottom-up” understanding (analytic, technical), or both (Armstrong, 1994, p.3).*

*This intelligence involves the ability to understand the world and give information back to the world by using and understanding sound (Gaffney, 1995, p. 6). Clearly, musically intelligent people are sensitive to rhythm, melody, and pitch as exemplified by singers, musicians, and composers (Armstrong, 1994, p.3).*

*Musical intelligence is not limited to those who can play, but also serves the millions of music lovers, collectors and others who work in the industry. “Yet, there is also a core set of abilities crucial to all participation in the musical experience of a culture. These core abilities should be found in any normal individual brought into regular contact with any kind of music” (Gardner, 1983, p. 104). Musical intelligence has considerable application in the world of science. Physicians (Gaffney, 1995, p.6) must listen carefully to a stethoscope to give a prognosis to the patient, thus conjoining an appreciation of sound and the patterns it creates. Individuals are*

*sensitive to musical contour and ultimately have schemes; or 'frames' for hearing music (Gardner, 1983, pp. 107-108). Music has the capacity to inspire us, intensify and reflect our emotions, and is used to express triumphs and helps us to endure great tragedies. As David Lazear states:*

*Musical-Rhythmic Intelligence includes such capacities as the recognition and use of rhythmic and tonal patterns, and sensitivity to sounds from the environment, the human voice, and musical instruments. Many of us learned the alphabet through this intelligence and the "A-B-C song." Of all forms of intelligence, the "consciousness altering" effect of music and rhythm on the brain is the greatest. (Lazear, 1991a, p. 15)*

#### *The Personal Intelligences: Interpersonal and Intrapersonal*

*Although the next two intelligences (interpersonal and intrapersonal) will be discussed separately, neither intelligence can develop totally without the other (Gardner, 1983, p. 241). The roles that different cultures play in stressing the values of the two intelligences may also lend support in respect to their relative autonomy. Gardner's summary for his rationale for supporting the two personal intelligences follows:*

*There is an identifiable core to each, a characteristic pattern of development, a number of specific end-states, as well as impressive evidence for neurological representation and for discernible patterns of breakdown (Gardner, 1983, p. 242). Definitions of these two competencies should initiate the distinction between these two forms of intelligence.*

*The sense of self and the development of personhood is equally developed through both of the personal intelligences. Gardner defines the core capacity of the personal intelligences as "an emerging sense of self" (Gardner, 1983, p. 242). "The wide variety of 'selves' encountered*

throughout the world suggests that this sense is better thought of as an amalgam, one that emerges from a combination of one's intrapersonal and interpersonal knowledge. . . I shall use the term *sense of self* to refer to the balance struck by every individual - and every culture - between the promptings of "inner feelings" and the pressures of "other persons" (Gardner, 1983, p. 242). Thus, the sense of self can be traced in every person to two separate forms of personal intelligence - one directed inward and the other outward, and they can develop individually and merge with each other (Ibid, 243).

Gardner states that these two intelligences have much in common in their capacity to know self and others; yet they also reveal clear distinctions in respect to each other and to other forms of intelligence:

*The personal intelligences amount to information-processing capabilities - one directed inward, the other outward. . . The capacity to know oneself and to know others is as inalienable a part of the human condition as is the capacity to know objects or sounds, and it deserves to be investigated no less than these other "less charges" forms. Personal intelligences may not prove completely cognate with the forms of intelligence we have already encountered - but as I pointed out at the start of this inquiry, there is no reason to expect that any pair of intelligences will be completely comparable. What is important is that they should be part of the human intellectual repertoire, and that their origins should take roughly comparable forms the world over. (Gardner, 1983, p. 243)*

Although these intelligences develop with each other, their core components have a distinct realm and deserve separate treatment.

### Interpersonal Intelligence

*Interpersonal intelligence includes the individual's capacity "to understand, perceive and discriminate between peoples moods, feelings, motives, and intentions" (Gaffney, 1995, p. 8). Particularly the artists, being the experts in the human terrain, know their audiences, how to make them laugh or cry, while providing insight into their lives (Gaffney, 1995, p. 7). Armstrong provides further marshaling of this concept by his definition:*

*The ability to perceive and make distinctions in the moods, intentions, motivations, and feelings of other people. This can include sensitivity to facial expressions, voice, and gestures; the capacity for discriminating among many different kinds of interpersonal cues; and the ability to respond effectively to those cues in some pragmatic way (e.g., to influence a group of people to follow a certain line of action). (Armstrong, 1994, p. 3)*

*The core components of interpersonal intelligence deal with a person's "capacity to discern and respond appropriately to the moods, temperaments, motivations, and desires of other people" (Armstrong, 1994, p. 3). Gardner describes the core capacity of interpersonal intelligence to involve all the modalities of mood, temperament, motivation and intentionality:*

*The core capacity here is the ability to notice and make distinctions among other individuals and, in particular, among their moods, temperaments, motivations, and intentions. Examined in its most elementary form, the interpersonal intelligence entails the capacity of the young child to discriminate among the individuals around him and to detect their various moods. In advanced form, interpersonal knowledge permits a skilled adult to read the intentions and desires - even when these have been hidden - of many other individuals and, potentially, to act upon this knowledge - for example, by influencing a group of disparate individuals to behave along*

*desired lines (Gardner, 1983, p. 239).*

### *Intrapersonal Intelligence*

*Intrapersonal intelligence refers to the capacity to accurately know one's self, have the ability to understand one's internal makeup; and some words that reflect levels of the intrapersonal intelligence are: originality, discipline, imagination, self-respect, temperament, inspiration, motivation (Gaffney, 1995, p. 8). Armstrong complements this definition:*

*Self-knowledge and the ability to act adaptively on the basis of that knowledge. This intelligence includes having an accurate picture of oneself (one's strengths and limitations); awareness of inner moods, intentions, motivations, temperaments, and desires; and the capacity for self-discipline, self-understanding, and self-esteem. (Armstrong, 1994, p. 3)*

*This intelligence is valued in our society as reflected in "religious systems, psychological theories, rites of passage. . ." (Ibid., p. 7). The origins of intrapersonal intelligence may be found in people who make lists; not lists of things to do or buy, but lists that are made to motivate themselves or take the initial step in solving a problem (Gaffney, 1995, p. 8). Gaffney mentions some other ways of advancing this intelligence may be through personal reflection, meditation or spending time enjoying nature (Ibid., p. 10). As a footnote to intrapersonal intelligence some sources are proposing that another intelligence be added to Gardner's list. Emotional intelligence may someday have that distinction, but for now it is a vital part of the personal intelligence (Gretchen, 1997, p. 1).*

*The core capacities of intrapersonal intelligences include the ability to gain entrance to one's own feeling life and the capability to differentiate among one's own emotions; knowledge of*



one's own strengths and weaknesses (Armstrong, 1994, p. 6). Gardner summarizes the core components of the intrapersonal in this manner:

*The core capacity at work here is access to one's own feeling life - one's range of affects or emotions: the capacity instantly to effect discriminations among these feelings and, eventually, to label them, to enmesh them in symbolic codes, to draw upon them as a means of understanding and guiding one's behaviour. In its most primitive form, the intrapersonal intelligence amounts to little more than the capacity to distinguish a feeling of pleasure from one of pain and, on the basis of such discrimination, to become more involved in or to withdraw from a situation. At its most advance level, intrapersonal knowledge allows one to detect and to symbolize complex and highly differentiated sets of feelings (Gardner, 1983, p. 239).*

#### Naturalistic Intelligence

*Naturalistic Intelligence has been added to the original seven in 1996 (Campbell, et al. 1996 & Hoerr, 1997). This intelligence refers to pursuing, comprehending and marshaling patterns in the natural surroundings (McDermott, 1997a, p2). An example might be someone who seeks patterns in the world, seeing order instead of chaos, and who shows proficiency in the recognition and classification of plants and animals (Barkman, 1997, p. 1). "This could be anyone from a molecular biologist to a traditional medicine man using herbal remedies" (Campbell, 1997, p. 1).*

*Gardner responds in an interview that "The core of the naturalist intelligence is the human ability to recognize plants, animals, and other parts of the natural environment, like clouds or rocks" (Durie, 1997, p. 1). This capacity has been a key to the survival of mankind and*

to his climb up the evolutionary ladder. Although all of us have some of this intelligence, some children become experts on dinosaurs and some adults excel at their pursuits in hunting, botany, and anatomy (*Ibid.*, p. 1). While the ability doubtless evolved to deal with natural kinds of elements, it has been extended to deal with the world of man-made objects. We are good at distinguishing among cars, sneakers, and jewelry, for example, because our ancestors needed to be able to recognize carnivorous animals, poisonous snakes, and flavourful mushrooms (Durie, 1997, p. 1).

Gardner suggests that his original list of seven intelligences was only a temporary one, and some other intelligences that have been proposed are sensibility, humour, intuition, creativity, and spirituality (Gaffney, 1995, p. 9). Gaffney also believes that spirituality may possibly be a function of intrapersonal intelligence. "Other authors have suggested friendly revisions, such as the need for a 'moral' intelligence" (Klien, 1997, p. 378). Gardner is apparently considering adding a ninth intelligence called existential intelligence which refers to the domain of philosophers and priests (McDermott, 1997b, p. 2).

### MI Theory and Education

In light of the great diversity of learners, MI theory as a tool suggests there may be more than one way to achieve educational learning expectations. A presentation of the curriculum that reflects all of the intelligences can offer students multiple paths to understanding (White et al., 1992). It is a poor assumption, however, to think that every intelligence needs to be reflected in every lesson (Gardner, cited in Checkley, 1997; Hoerr, 1996). Walters and Gardner (1984b) distinguish between intelligences as "content of instruction" and as the "means" for

*communicating that content. Ideally, the learner must learn the content of a domain through the related intelligence (i.e. learn math in a logical-mathematical way) because content in one domain cannot be “translated” entirely to another domain. However, if a student struggles with the content, the teacher can supply an alternate route to it, perhaps through the medium of an intelligence in which the individual is strong. Still, at some point, the learner must “translate back” into the initial domain; otherwise, the content learned will remain superficial.*

### *Educating the Intelligences*

*Gardner makes several points about the intelligences in general. First, each individual has his or her own intelligence profile, normally possessing all eight intelligences but to varying degrees (1983). In fact, a particular combination of intelligences might be greater than the simple sum of its parts because of how it enables an individual to fit a niche uniquely well. Since nearly every adult cultural role involves a combination of intelligences, Gardner prefers to think of individuals as possessing a set of aptitudes and attributes (Walters & Gardner, 1984). Table 1 shows the essential attributes of MI theory.*

*Intelligences are educable. Though there may be genetic factors that set an upper limit on an intelligence, such a biological limit is rarely if ever approached. Sufficient exposure to the materials of an intelligence would allow any normal individual to attain significant intellectual achievement in it (Gardner & Walters, cited in Gardner, 1993). Educating the intelligences and helping individuals reach vocational and avocational goals appropriate to their particular aptitudes is, in Gardner’s view, the whole purpose of school (Gardner, 1993).*

*Although a variety of goals and tasks can be accomplished through each intelligence,*

*there are particular types of material and problems proper to each one and manifested in specific domains. Though a strong intelligence might be mobilized to help a learner grasp material in a domain proper to a weaker intelligence, "a person cannot develop fully or assess accurately one intelligence through the medium of another" (White et al., 1992, p. 183).*

Table 1:

Essential Attributes of MI

**Verbal-Linguistic:** focuses thinking on language, both aural and symbolic

- \* a sensitivity to semantics - the meaning of words
- \* a sensitivity to syntax - the order among words
- \* a sensitivity to phonology - the sounds, rhythms, and influences of words
- \* a sensitivity to the different functions of language, including its potential to excite, convince, stimulate, convey information, or please

**Logical-Mathematical:** orientated toward thinking: inductive and deductive logic, numeration, abstract patterns; contemplative problem solver

- \* the ability to use numbers effectively
- \* the ability to use inductive and deductive reasoning
- \* the ability to recognize abstract patterns

**Visual-Spatial:** depends on visual and proximity thinking; thinks in images; imaginative

- \* the ability to perceive the visual-spatial world accurately
- \* the ability to think in pictures or visual imagery
- \* the ability to graphically represent visual or spatial ideas
- \* the ability to orient the body in space

**Musical-Rhythmic:** responds to acoustic patterns, sounds rhythms, and tempo

- \* a sensitivity to pitch (melody), rhythm, and timbre (tone)
- \* an appreciation of musical expressiveness
- \* an ability to express oneself through music, rhythm, or dance

**Bodily-Kinesthetic:** involves physical movement and knowledge of the body; usually large muscle activity; coordinated

- \* the ability to control one's body movements to express ideas and feelings
- \* the capacity to handle objects skillfully, including the use of both fine and gross motor movements
- \* the ability to learn by movement, interaction, and participation

**Interpersonal:** orientated toward social or group relationships; affectively communicative; cooperative

- \* the ability to focus outward to other individuals
- \* the ability to sense other people's moods, temperaments, motivations, and intentions
- \* the ability to communicate, cooperate, and collaborate with others

**Intrapersonal:** identifies with intuition and introspection; self-knowledge (not necessarily introverted)

- \* the ability to look inward to examine one's own thoughts and feelings
- \* the ability to control one's thoughts and emotions and consciously work with them
- \* the ability to express one's inner life
- \* the drive toward self-actualization

**Naturalist:** recognizes and classifies plants, animals, and minerals including a mastery of taxonomies

- \* the ability to understand, appreciate, and enjoy the natural world
- \* the ability to observe, understand, and organize patterns in the natural environment
- \* the ability to nurture plants and animals

### The Role of MI in Creating More Effective Teachers

MI theory can play an important role in producing more effective teachers. An awareness of MI theory can stimulate teachers to find more ways of helping all students in their classrooms, and therefore, become more effective teachers. Linda Campbell (1997) outlines the curriculum adaptations teachers are currently making in their classrooms to help embrace MI theory:

- \* *Lesson design:* this might involve team teaching (teachers focusing on their own intelligence strengths), using all or several of the intelligences in their lessons, or asking student opinions about the best way to teach and learn certain topics.
- \* *Interdisciplinary units:* schools often include units that inter-link subject areas.
- \* *Student projects:* students can learn to initiate and manage complex projects when they are creating student projects.
- \* *Assessments:* are devised to allow students to show what they have learned. Sometimes this takes the form of allowing each student to devise the way he or she will be assessed, while meeting the teacher's criteria for quality.
- \* *Apprenticeships:* can allow students to gain mastery of a valued skill gradually, with effort and discipline over time.

### Summary

Gardner's theory of multiple intelligences (MI) has become a valuable aid for educators, and for good reason. Individuals have several intellectual potentials which are defined, shaped, and combined by the surrounding culture. The "theory" is not truly child centred, but educational adaptations of it lead to child centred practices. Thus the focus is on the child, rather than the intelligence measure. The multicultural implications of MI are strong because of an emphasis that accounts for diverse abilities, valued to varying degrees, and found in different cultures. MI is a notion about the human being's intellectual endowment, a notion that appeals to educators'

views about children and cultures (Torff, 1997).

### MI Assessments

*Assessing intelligence can be a perplexing issue. How intelligence is defined directly influences the assessment procedures used. Traditionally, intelligence was viewed as a single entity that was static. However, reconceptualizations of the nature of intelligence are changing this view. The implications of MI theory for education are firmly grounded in the area of assessment. It is difficult, if not impossible, for teachers to develop and implement activities that incorporate multiple intelligences unless they can identify and assess the intelligence areas.*

*Much attention has been given to curriculum and instruction design to help teachers create and teach MI infused lessons; much less has been written about alternative assessment methods based on MI. (Torff, 1997) Gardner's ideas grew out of discomfort with the reign of linguistic and logical-mathematical abilities - those measured by standardized tests emphasized by upper/middle class Anglo-Saxon society. Tests were intended to predict future adult success, yet cognitive ability tests account for only 4% of the variance in job performance (Wigdor and Gardner, 1982).*

*Howard Gardner and David Perkins (1991), at the Harvard Graduate School of Education, codirect Project Zero, an educational research organization. This project is aimed at improving educational practices through systematic studies of thinking, learning, and teaching. The research is grant-funded. Gardner and his colleagues are building a research base on the educational implications of MI, but make no attempt to form an "MI Method". Although*



*researchers at the project make suggestions for applying MI to education, they also encourage educators to develop their own ideas (Hatch, 1993).*

*In recent work, Gardner and his colleagues at Project Zero promote the idea that both curricula and assessments need to reflect “authentic” activities that students are likely to experience outside of school. Projects to be completed would be similar to those encountered everyday by carpenters, artists, historians (Gardner, 1991). Instead of taking a test at the end of the project, students could reflect on the experience and gain a deeper understanding of the material and possibly manners in which products might be improved.*

*Gardner (1993) suggests the following principles in a fresh approach to assessment. First, he emphasizes assessment rather than testing. He defines assessment as obtaining information about the skills and potentials of individuals, with the dual goal of providing useful feedback and data to the individual and community. Secondly, Gardner states that assessment should be simple, natural, and should occur on a reliable schedule. Initially, the assessment may be clearly defined; after a while, however, much would occur naturally through collaborative planning on the part of the student and teacher.*

*A problem with many formal tests is their ecological validity. Intelligence tests and scholastic aptitude tests are often questioned because of their limited usefulness in predicting performance beyond the next year in school. For this reason, Gardner emphasizes that individuals must be assessed in situations that closely resemble “actual working conditions”. Only then is it possible to make predictions about their ultimate performance.*

*In Gardner’s view, instruments used to assess must be “Intelligence Fair”. Most testing*

*instruments are biased heavily in favour of the linguistic and logical-mathematical intelligences. Students adept in these areas usually perform well on most kinds of formal tests, but those with difficulties in either, or both, may fail because they cannot master the particular format of most standard instruments. The solution is to devise instruments that are "intelligence fair," that look directly at the intelligence in operation. For example, a test of musical intelligence needs to involve music, not just written questions regarding music.*

*Gardner suggests that multiple measures be used to tap different facets of the capacity in question. For example, to state that a child is not gifted unless in the top 3% of those tested is limiting; whereas, offering several options, in which consideration is given to the child's determination and goals, or giving a trial period before refusing admission into a program is less obtrusive. This leads to the need for sensitivity to individual differences, developmental levels and forms of expertise. Good teachers have always realized that different approaches will be effective with the varying aptitudes, learning styles, and difficulties of the students. Such sensitivities can be drawn upon in the course of regular teaching as well as during assessment.*

*Examining and assessing the strengths of a child are beneficial to all children and serve as an enhancement tool that can be used in many different ways. One example of a good assessment instrument is the child's learning experience. The use of intrinsically interesting and motivating materials occurs in a context of students working on problems, projects, or products that genuinely engage them, hold their interest, and motivate them to do well. Finally, the application of assessment for the student's benefit serves to move away from the goal of ranking students to spending time helping them. Identifying areas of strengths as well as*

*weaknesses, providing suggestions for a course of study, pointing out which habits are productive, explaining what is expected in future assessments are all helpful. Concrete suggestions and appropriate curricular enhancement in the area of identified strength, independent of rank within a comparable group of students, is especially important.*

*Having examined the research on teacher effectiveness and the theory of multiple intelligences (Gardner, 1983), a critical review of five MI theory based assessments follows: MIDAS (1997), Teele (1992), Lazear's (1994), and the DISCOVER (1996) Assessment, and Rivera's (1996) Multiple Intelligences Inventory for Teachers. The assessments selected for review are different in administration, yet all aim to identify areas of strength and are purported to be designed around an MI framework. Elements in each of these could be adapted as a potential of teacher effectiveness.*

#### *The MIDAS Assessment*

*The Multiple Intelligences Development Assessment Scales (MIDAS) was developed by Branton Shearer (1997) with the intention of obtaining a descriptive assessment of a student's multiple intelligence profile. It is a self-generated report that measures intellectual disposition, and is to be filled out by either the child or parent. Two assessments are available, one for adults, and one for children. Questions about each intelligence are to be answered by the individual, in the form of "do you" or "how well do you". The respondents rate themselves on a scale of A - F, "a little bit" to "excellent" or "I don't know", according to his or her self-perception.*

*The MIDAS assessment (1997) includes a variety of questions about each intelligence for the individual to determine which intellectual domain they prefer. The strictly linguistic*

*presentation is similar to that of a typical intelligence test; the comprehension of the reader could affect accurate results and preferences. The interpretation of ability strictly reflects the opinion of the person answering the questions. Possibly of greatest concern is that the questions are not asked in relationship to problem-solving activities, a necessary component according to Gardner's definition of intelligence. . . "The ability to solve a problem or make something that is valued by a culture." (Gardner, 1991) If the questions were applied to the usage of the particular intelligence in a problem-solving situation, how might the results differ? According to Corbet (1997), the MIDAS Scale is not a true assessment of ability, but rather an assessment of preferences and "feelings". (p. 19)*

#### *The Teele Inventory Assessment*

*The Teele Multiple Intelligences Assessment, developed by Dr. Sue Teele (1992), involves looking at a series of panda pictures, organized in sets of two. One picture might show a panda dancing in a ballet costume; the other picture might show a group of pandas, engaged in what appears to be a game. Individuals choose the picture that best describes themselves. The pictures can be viewed by watching still shots on a video tape, or by looking at a book. There are twenty-six comparisons; each choice is then scored according to the intelligence it represents, and is then tabulated by counting intelligences that were selected most often. There are four areas of strength determined according to each viewer's picture choices.*

*The visual presentation this assessment employs, like the MIDAS, determines the preferences of the test taker, rather than assessing actual strength and ability. However, as with the MIDAS assessment, the Teele assessment may tend to identify learning style (Corbet,*

1997) rather than a particular intellectual strength. Learning styles are very different from multiple intelligences. According to Gardner (1997) "Multiple Intelligences claims that we respond, individually, in different ways to different content, such as language or music or other people." One might say that a child is a visual learner, but that does not infer that the child has strong spatial intelligence.

### Lazear's Behaviour Log

David Lazear, author of several MI books compiled an assortment of assessment tools in his book, Multiple Intelligence Approaches to Assessment (1994). In this book, he examines paradigms in assessments, then offers suggestions as to how multiple intelligence report cards might be utilized. He suggests methods of assessing through the use of behaviour logs, skill games, and complex problem-solving. The behaviour log lists five behaviours that might be observed within each of the seven intelligences first indicated by Gardner. Each behaviour is then scored on a 0 - 4 scale with 4 equating a strong "fit" to the student. An example of the Verbal-Linguistic Behaviour is "Precisely expresses her - or himself both in writing and talking." Under the Musical-Rhythmic Behaviours list is, "Can remember songs and rhymes easily." Intelligence profiles are then created by translating the scores on a scoring sheet. The results are available to help students and educators examine dominance in the various intelligences.

### The DISCOVER Assessment

The DISCOVER Assessment, created by Dr. June Maker, Dr. Judith Rogers, and Dr. Aileen Neilson, is aimed at observing students in the actual process of solving problems. The assessment consists of five components, each intended to identify superior strength in a

*certain area. The specific intelligences being examined are linguistic, logical-mathematical, and spatial; however, the observers are trained to document interpersonal, intrapersonal, bodily-kinesthetic, and musical influences. The assessment requires that observers be trained in understanding the intelligences, as well as interpretation of student actions. In addition to the cost of training, specific, reusable supplies must be purchased that are used by the students during the different activities.*

*The fact that there are five components involved in this assessment, in comparison to one in the MIDAS and Teele, and no specific component in Lazear's book, sets it apart from the other assessments examined. The components are Pablo, tangrams, storytelling, story writing, and math. The story writing and math sheet are completed in a traditional classroom setting, with each student doing work on an individual basis. Pablo, an activity incorporating the use of colourful, geometrically designed, cardboard pieces is used to identify spatial intelligence. Tangrams are used to have students complete puzzles of increasing difficulty levels to identify logical-mathematical ability. Storytelling is generated through the use of seven non-descriptor toys which are incorporated into a story of the child's choice. All activities are observed in a group setting where students are asked to complete different types of problems. Problems in all problem sets move from a closed-ended solution to totally open ended possibilities.*

*A major drawback of this assessment is maintaining consistency between the observers. A checklist is used to document certain behaviours exhibited by students, yet there are times when the criteria for rating students is disagreed upon between observers. (Corbet, 1997) By virtue of its open-ended foundation, the evaluation is admittedly subjective and observers of the*

multiple intelligences in their classrooms, are much more likely to be in agreement. Mindy Kornhaber wrote a doctoral thesis on a similar subject, and cited similar concerns about observer reliability, and unclear scoring procedures (Kornhaber, 1997).

#### Rivera's Multiple Intelligences Inventory for Teachers

The "Multiple Intelligences Inventory for Teachers", developed by Deborah Rivera (1996), is an inventory for teachers to use in observation of their students. The study provided teachers of fourth and fifth graders to complete a checklist consisting of ninety-two behaviour descriptors associated with the seven intelligence areas. A Likert Scale was provided for teachers to rate the students. In this study, a seven factor solution was used, however, not in direct correspondence with Gardner's seven intelligence areas. Although this assessment could become a useful instrument to assess student abilities, the question of whether it could be used to assess Gardner's theory of multiple intelligences requires further investigation. (Rivera, 1996, pp.141-142).

#### Summary of Validity and Reliability of Assessments Using MI Theory

In the school setting, the teacher's role is to ascertain students' abilities, pinpoint areas that need strengthening, and target weaknesses. Eisner (1994) asserts the need to move away from a view of intelligence as a fixed entity and to an understanding on intelligence "involving capitalization on strengths and compensation for and remediation of weaknesses" (p. 563).

Acknowledging that a student may be intelligent in ways outside the traditional conception of intelligence (linguistic and logical-mathematical) is the first step to enabling students to reach their full potential and help teachers to become more effective as educators.

*Without teacher affirmation, it is impossible for the other intelligences outside of linguistic and logical-mathematical to be addressed in the classroom. Since all of the intelligence areas contribute to student learning, the lack of teacher emphasis on multiple intelligences presents a challenge.*

*Most of the information supporting the MI theory is practical in nature and not empirically based. Published articles available in the literature provide descriptions of how several schools have adopted MI theory and how they are implementing programs that focus on these eight intelligence areas (Ellison, 1992; Hatch & Gardner, 1986; Hoerr, 1992; Krechevsky, 1991). Table 2 adapted from Georg (1997) illustrates techniques teachers can use following Multiple Intelligences theory as assessment strategies.*



*Table 2:*  
**MI Assessment Menu**

**Verbal-Linguistic**

written *essays*  
vocabulary *quizzes*  
recall or verbal information  
*cassette recordings*  
poetry writing  
linguistic humour  
formal *speeches*  
*cognitive debates*  
listening and reporting  
learning logs and journals

**Logical-Mathematical**

*cognitive organizers*  
complex reasoning  
pattern games outlining  
logic and rationality *exercises*  
mental menus and formulas  
*deductive reasoning*  
inductive reasoning  
calculation processes  
logical analyses and critiques

**Bodily-Kinesthetic**

lab *experiments*  
dramatizations  
original and classical dance  
charades and mimes  
impersonations  
human tableaux  
invention projects  
physical exercise routines and games  
skill demonstrations  
illustrations using body languages and gestures

### Musical-Rhythmic

*creating concept songs and raps*  
*illustrating with sound*  
*discerning rhythmic patterns*  
*composing music*  
*linking music/rhythm with learned concepts*  
*orchestrating music*  
*creating percussion patterns*  
*recognizing tonal patterns and quality*  
*analyzing musical structure*  
*reproducing musical and rhythmic patterns*

### Visual-Spatial

*murals and montages*  
*graphic representations and visual illustrating*  
*visualization and imagination*  
*reading, understanding, and creating maps*  
*flowcharts and graphs*  
*sculpting and building*  
*imaginary conversations*  
*mind mapping*  
*video recording photography*  
*manipulative demonstrations*

### Interpersonal

*group jigsaws*  
*reciprocal teaching*  
*“think-pair-share”*  
*round robins*  
*giving and receiving feedback*  
*interviews, questionnaires, and “people searches”*  
*emphatic processing*  
*random group quizzes*  
*assessing teammates*  
*testing, coaching, and retesting*  
*group projects*  
*role-plays*

**Intrapersonal**

*autobiographical reporting*  
*personal application scenarios*  
*metacognitive surveys and questionnaires*  
*complex introspective questions and answers*  
*concentration tests*  
*feelings diaries and logs*  
*personal projection*  
*self-identification reporting*  
*personal history correlation*  
*personal priorities and goals*

**Naturalist**

*taxonomy collections*  
*charts*  
*dioramas*  
*field trip tour guide*  
*video collection*  
*nature observation logs*  
*population analyses*  
*photo logs*  
*specimen collections*  
*narrated travelogs*

## CHAPTER IV. ANALYSIS AND FINDINGS

*Twelve studies on teacher effectiveness were chosen from North America and Australia by the researcher to look for MI elements. The twelve selected studies do not reflect a low number or lack of research in teacher effectiveness. Rather, they were chosen once a saturation point was reached in the data collection of research methodologies in teacher effectiveness literature. The twelve studies were then sorted alphabetically and are summarized under the following headings: research method(s), school level, intelligence(s), and measures/themes. The information gathered from these headings is indicated in point form in the Table 3 "MI Dimensions in Teacher Effectiveness Research" Chart. The twelve studies used qualitative and quantitative research methodologies, mixed methodologies, and evaluations. It is important to note, however, that evaluations on teacher effectiveness varied and were conducted by teachers doing evaluations of effective teacher traits (Ocepek, 1993), principal evaluations of effective teachers (Cloer and Alexander, 1992), teacher self evaluations (Cloer and Alexander, 1992; Currie, 1985), and student evaluations of effective teachers (Buntrock-Brodney, 1993; Comadena, et al, 1990; Patrick and Smart, 1998; Ryan and Harrison, 1995). For student evaluations in particular, it is important to note that it is difficult to do an evaluation of teachers without examining the intricacies and methods of student evaluations. For instance, the manner in which a student evaluates effective teachers may have more to do with the teacher's personal appeal to the students than being representative of teaching effectiveness.*

*As indicated in the previous chapter, assessments on MI already exist, however, none*

*relate directly to teacher qualities and instructional techniques or to the area of teacher effectiveness research. The researcher's purpose is to analyze the teacher qualities and instructional techniques that have emerged as themes or were measured in teacher effectiveness studies. The "MI Teacher Qualities and Instructional Techniques Chart" integrates the "How to Teach to the Eight Intelligences" and "Multiple Intelligences Subcapacities" charts (Georg, 1997) to form the lens that the researcher uses to examine the MI elements in teacher effectiveness research [see Table 3].*

Table 3:

MI Instructional Techniques & Teacher Qualities

## Verbal-Linguistic

Instructional Techniques: Use of lectures, large and small group discussions, books, worksheets, manuals, texts, writing activities, words on the chalkboard or overhead projector, word games, sharing time, student speeches, storytelling, “talking” books and cassettes, extemporaneous speaking, oratory, debate, dramatic interpretation, choral reading, individualized reading, reading to the class, memorizing linguistic passages and facts, tape recordings, printing presses, duplicating machine, letter stencils, label makers, typewriters, word processors, gives clear instructions

Teacher Qualities: highly auditory, a reader, processes through listening, a storyteller, understands diverse vocabulary, a good speller, a wordsmith, etymology trivia, awakened by words, loquacious, writes endings, “tape recorder” memory

## Logical-Mathematical

Instructional Techniques: Use of calculators, statistical charts, mathematical problems on the board, scientific demonstrations, critical-thinking activities, linear outlining, logical problem-solving exercises, brain teasers, logic puzzles, logic games (chess), computer programming languages, science experiments, mathematical manipulatives, mental calculation activities, logical/sequential presentation of subject matter, use of probing questions, Piagetian cognitive stretching exercises, science-fiction scenarios

Teacher Qualities: makes and uses patterns, discerns relationships, reasons logically, devises experiments, thinks inductively, hypothesizes, uses abstract symbols, easily draws conclusions, inventive, likes challenges, makes observations, problem solves

## Bodily-Kinesthetic

Instructional Techniques: Use of touching, feeling, movement, drama, mime, improvisation, dance, competitive and noncompetitive sports, physical awareness exercises, “hands-on” activities, crafts, kinesthetic imagery, clay, cooking, gardening and other messy activities, manipulating materials of all kinds, acting out new concepts, permission to squirm and fidget, jumping, running, tapping and turning, body language, hand signals, tactile activities, facial expressions, physical relaxation exercises, moves deliberately throughout classroom

Teacher Qualities: timing, direct involvement, concrete experiences, grace and precision, physical performance, motor skills, dexterity and balance, healthy standards, expresses with body, do, touch, act, touches and talks, energetic

### Musical-Rhythmic

**Instructional Techniques:** Use of singing; humming; whistling; playing recorded music from records, cassettes, or CDs; playing live music; group singing; environmental sound recordings; listening to noises; background music while studying; linking old tunes with new concepts; creating new music for old concepts; listening to inner musical images

**Teacher Qualities:** collects music, sings and plays, music vocabulary, creative, remembers melodies, hums and whistles, rhythmic, pitch sensitivity, drawn to music, responds to sound, emotional and aesthetic, recognizes variations in music

### Visual-Spatial

**Instructional Techniques:** Use of charts, graphs, diagrams, maps, graphic organizers, mind maps, photographs, videotapes, slides, puzzles, mazes, construction kits, visualization exercises, art activities, imaginative storytelling, metaphor, creative daydreaming, mechanical reasoning puzzles, drawing images on the board, colour, rearrangement of the room, visual thinking exercises, computer graphics software, visual patterns, optical illusions, cameras, telescopes, microscopes and binoculars, visual awareness exercises

**Teacher Qualities:** internal imagery, physical creator, 3-D imagery, perceives patterns, abstract designs, visual representations, astute observer, mazes and puzzles, spatial navigator, image creator, photographic memory, external perceiver

### Interpersonal

**Instructional Techniques:** Use of cooperative learning, group activities of all kinds, social games, simulations, interpersonal sensitivity activities, conflict mediation, peer teaching, group discussions and problem-solving sessions, community involvement, apprenticeships, academic clubs, noncompetitive learning groups, interactive software, frequent parties or social gatherings

**Teacher Qualities:** socializer, interactive, mediator, active listener, considers consequences, anticipates behaviours, opinion influencer, cooperative team player, communicator, knows where others are coming from, empathizer

### Intrapersonal

**Instructional Techniques:** Use of independent study, self-paced instruction, individualized projects and games, private spaces, time for introspection, patience, interest centres, biographies, autobiographical exercises, options for assignments, choices for subjects to be studied, self-initiated activities, self-correcting materials, programmed instruction that self-teaches, exposure to inspirational/motivational curricula, journal-keeping activities, goal-setting exercises, reflective listening

**Teacher Qualities:** asks why, strong-willed, self-reflective, marches to a different drummer, self-actualizer, intuitive, consciousness, introspection, self-directed, independent, accurate model of self, ethical system

### Naturalist

**Instructional Techniques:** Use of relationships among systems or species; collections and real objects for the purpose of classification and building taxonomies; intuitive concepts and relationships; classification activities; relationships such as patterns, order, and compare-and-contrast sets of groups; collections that can be expanded or rearranged; mind mapping to show how taxonomies and classification systems are interrelated; connections to real life and science issues; connections between known classification systems and new concepts

**Teacher Qualities:** holistic thinker, relationships (formal: taxonomies, e.g., dinosaurs, roses) & (informal: artificial taxonomies, e.g., cars, clothes), connects capabilities, recognizes specimens, values the unusual, aware of species: flora/fauna, classifies species, categorizes organisms



*Table 4 provides the background information on the twelve studies selected for this research. The table includes a brief abstract by listing the research methodologies employed and the findings in the studies. Following Table 4, the results of the study are organized into seven sections, with each section corresponding with Gardner's theory of multiple intelligences. Under each intelligence heading, the section is further divided into an analysis of the following: school level & research methods, instructional techniques, teacher qualities and description of findings. The intelligences' use in teacher effectiveness research has been ranked in accordance with the number of studies containing elements of the intelligence and appears in descending value.*

*Lastly, the studies analyzed have been categorized into the "MI Dimensions in Teacher Effectiveness Research" chart [see Table 5] that includes the authors and year of the study, research methods employed, school level the study was conducted at, the intelligences represented as compared to Table 3's "MI Teacher Qualities and Instructional Techniques" chart, and the measures or themes that were used to determine teacher effectiveness in the study.*

Table 4:

Selected Effective Teacher Research: A Summary of the Twelve Studies

1. Buntrock-Brodney, S (1993): examined the relationship between student achievement, student attitude, and student perceptions of teacher effectiveness. Students in an elementary school were asked to keep journals documenting their learning in mathematics and then given tests on Comprehensive Test of Basic Skills (CTBS) in math to measure achievement. The Our Class and Its Work inventory was also used to measure student perception of teacher effectiveness in the teaching of mathematics. It contained eight subscales: Didactic Instruction, Enthusiasm, Feedback, Instructional Time, Opportunity to Learn, Pacing, Structuring Comments, and Task Orientation. The Roland attitude scale was then used to assess student attitudes toward mathematics and contained four scales: Confidence in Learning Mathematics, Mathematics Male Domain, Teacher Scale, and Usefulness of Mathematics.

Findings: There was a lack of significance on the student attitude scale. The researcher felt this lack of significance can be attributed to the 44 questions the students were required to answer. At the elementary level, the researcher felt it was too long and complicated for the students (Buntrock-Brodney, 1993, p. 79). However, the use of journals improved student perception of teacher effectiveness especially for children who were having problems in mathematics.

2. Burrell, D.L. (1994): administered the Teacher Locus of Control Scale (Rose and Medway, 1981) and the Rand Efficacy Scale (Armor, et al., 1976; Berman, et al., 1977) to 90 middle school teachers and compared these results to four years worth of student achievement scores produced by McGraw-Hill (Craig, 1993). The Teacher Locus of Control Scale (TLC) consisted of 14 student success and student failure items that required the teacher to react to 28 classroom events by selecting either an internal or external locus of control choice. The scores ranged from 0-14 points. High scores indicated an internal locus of control that showed that the teacher accepts the responsibility for student success or failure. The Rand Efficacy Scale consisted of 5 statements that required the teacher to range their response from strongly agree to strongly disagree (range of 6 choices). The results of the two instruments were then compared to the value added gain scores on student achievement tests for all the students that the teacher taught. Teachers' demographic variables including age, gender, race, certification and years of experience were also incorporated into the study and contrasted with locus of control and efficacy.

Findings: The study showed no significant relationship between teacher efficacy, locus of control and student achievement scores. However, it was concluded that female teachers tend to have a higher degree of efficacy and internal locus of control than do male teachers.

3. Cloer, T, & Alexander, W.A., Jr. (1992): teachers were asked to respond to twenty statements about schools, teachers, and students based on a pupil control ideology (Willower, Hoy, and Eidell, 1967). Teachers could select responses from "strongly agree" to "strongly disagree" on a 5 point Likert scale. The higher scores pointed to more humanistic attitudes while lower scores favoured more rigid, autocratic attitudes. The second part of the study had

principals rate teacher effectiveness. Principals rated the effectiveness of the teachers who completed the first part of the study using a scale of 1 to 5, with 1 being "low" and 5 being "superior." Higher scores on the principal's rating form represented higher effectiveness, lower scores represented lower effectiveness. A total of 235 teachers and their principals took part in the study. Teachers were also asked to provide demographic data that included their marital status, age, years of teaching experience, and subject areas.

Findings: The results of this study indicated that teacher attitudes that parallel the concept of humanistic behaviours correlate with effective teacher performance, as measured by school principals. A statistically significant difference was also found when teachers were analyzed according to subject areas. Teachers in math were significantly different from all other subject areas in pupil control ideology and effectiveness ( $p < .05$ ). Math teachers tended to express less humanistic and caring attitudes and as a group were rated less effective by their principals. No other significant differences were found among demographic information.

4. Comadena, M, Semlak, W.D., & Escott, M.D. (1990): compared and contrasted traditional undergraduates (those in their early twenties) and adult learners (average age was 36.50 years) (Comadena, et al., 1990, p. 6) for the perceptual differences amongst each group in their views on effective teaching and communication style.

192 traditional undergraduate students and 167 adult learners took part in the study. Teacher communication style was assessed by Norton's Communicator Style Measure (CSM; Norton, 1983). This instrument contained 45 Likert-type items designed to measure the way one verbally and nonverbally interacts with others. Teacher effectiveness was measured by students responding to five statements to report the extent to which they agreed or disagreed with each statement on a 5-point scale. Students' ratings on these 5 items were added together to produce a single teacher effectiveness score.

Findings: For the traditional undergraduate students, what they regarded as teacher effectiveness were the teacher traits of impression leaving, friendly, and attentive. For the adult learners, teacher effectiveness had the following elements: impression leaving, friendly, relaxed, attentive, dominant, and precise style variables. The researcher surmised that teacher communication style is very important to adult learners and the behaviour or conduct of the teacher is a more important component of teacher effectiveness than traditional undergraduate students.

5. Currie, D.G. (1985): administered the Teacher Skills Survey Instrument (Johnson, et al., 1980) to 580 teachers to provide information on what teachers perceive to be essential competencies necessary to enhance student learning. The instrument listed 52 competency statements and asked the respondents to rate the degree to which each was essential to effective teaching.

Findings: Of the 52 competencies identified on the survey instrument, more than 50% of the respondents rated the following as teacher competencies deemed "highly desirable":

a. During teaching he/she gives directions clearly and explains content so that the learners

understand.

- b. Reinforces (supports and encourages) the efforts of learners during instruction.
- c. Plans instruction to be compatible with the learners' personal capabilities and needs.
- d. Demonstrates enthusiasm for teaching and learning and for the subject he/she is teaching at the time.
- e. Adjusts teaching plans to changes in conditions as they normally arise (interruptions, proposed lesson "doesn't take", resources didn't arrive, etc.).
- f. Helps learners develop positive concepts of themselves (helps learners see their uniqueness, and encourages confidence and self-respect).
- g. Organizes time, space, materials and equipment for instruction.
- h. Exhibits professional traits of character (prompt, regular attendance, prepared for obligations, etc.).
- i. Expresses a positive personal attitude toward the teaching profession.
- j. Specifies (writes, selects, formulates) the learning objectives for the activities (lessons, units, etc.) which he/she plans to teach.

6. Delso, D.L. (1993): used McCracken's (1988) qualitative long interview method (used to probe the beliefs of individuals) to ascertain what eight veteran teachers (over five years of teaching experience) believe is effective teaching.

Findings: The veteran teachers interviewed considered the humanitarian aspects of good teaching very important. The effective teacher negotiates social problems and situations that arise in their students' personal lives to teach their students effectively. Good teachers spend time doing more than merely presenting subject material to their students (Delso, 1993, p. 105). Themes generated from this study also included: teacher flexibility: adapting instruction for individuals, meeting the individual needs of students; caring: taking a genuine interest in the people and events in their classrooms and teacher creativity and ingenuity.

7. Dickey, M.R. (1988): investigated and compared the effects of verbal instruction and modeling on middle school band students. Students were tested for ear-to-hand skills, kinesthetic response, and music discrimination skill.

Findings: Those students who received modeling instruction rather than verbal instruction demonstrated significantly greater ear-to-hand and kinesthetic response skills. The researcher concluded that modeling strategies and devices should play a greater role in instrumental music teaching.

8. Kondrat, D.C. (1989): conducted an ethnographic and interview-based study examining the characteristics of an effective teacher from the students' perspective. The study reviewed the lived experiences of present and former students of a teacher using the Hunter Model (1982) of teaching. This model is based on the following effective teacher criteria that Kondrat examined in his research:

- a. Motivation
- b. Providing Information Effectively
- c. Teaching to Both Halves of the Brain
- d. Making the Material Meaningful
- e. Checking for Understanding
- f. Extending their Thinking
- g. Dignifying Errors to Promote Learning
- h. Teaching so Students Remember

Findings: The study showed that students want a teacher who is prepared to use instructional techniques outlined in the Hunter Model in the classroom. The research findings also suggest that students preferred teachers that not only employ effective teaching practices, but exemplified these characteristics in their daily classroom routine. 156

9. Ocepek, L.J. (1993): administered a 42-item questionnaire to 290 high school teachers which indicated the practicality of Hudgins' (1990) six selected elements of effective teaching through value ratings and priority rankings. The six elements of effective teaching outlined by Hudgins (1990) are as follows: Classroom Climate, Questioning, Set Induction, Stimulus Variation, Reinforcement, and Closure.

Findings: The positive learning climate a teacher establishes was perceived as the most important of Hudgins' (1990) effective teaching criteria by the high school teachers. Included under the Classroom Climate heading in the survey were statements centering on the teacher's beliefs concerning the following: physical environment, psychological environment, enthusiasm, task orientation, classroom management, and discipline.

10. Patrick, J., & Smart, R.M. (1998): combined qualitative and quantitative research methods. 148 undergraduate students took part in the qualitative part of the study. Using Ramsden's (1991) argument that students are an essential source of information for the evaluation of effective teaching, students were asked to record, in their own words the qualities and or practices of effective teachers. The researchers then arranged the responses into thematic groups (36 in total). 266 undergraduates took part in the quantitative portion of the study. These students were asked to think of an effective teacher (from any stage of their education) and were then asked to rate that teacher on a 72 item questionnaire using a 5-point Likert scale ranging from 1 (doesn't describe the teacher very well at all) to 5 (describes the teacher almost perfectly).

Findings: Three interrelated elements were determined to be qualities of effective teaching. First, the teacher who genuinely respects students and treats them as equals is positively regarded by undergraduate students. Organization and presentation skills encompass the second teacher effectiveness factor while the third factor, ability to challenge students, is characterized by setting high, but realistic learning goals for the students.

11. Percy, R (1990): compared selected effective teacher behaviours and teacher attitudes towards children before and after teachers attended a one week systematic communication skills workshop. Based on Gordon's (1974) Teacher Effectiveness Training (TET) training model, 378 elementary and secondary teachers volunteered to participate in a one week, intensive, systematic communication skills training program. Each participant was administered the Communication Skills Survey at the beginning and at the end of the training program. The survey consisted of three subscales: the Attitude Toward Children Scale, the Active Listening Scale and the I-Message Scale. The Attitude Scale required teachers to answer 15 questions on a point scale 1-6. The Active Listening Scale and the I-Message Scale required teachers to write a verbatim response that demonstrated an ability to listen actively and to confront effectively. The latter two scales were scored on a scale from 1 to 5 by a single rater who was trained to teach the TET program and previously demonstrated a high level of proficiency in scoring the three scales.

Findings: For each of the three scales, there was a significant increase from the pretest to the posttest. These increases were all significant at the .001 level.

12. Ryan, J.M., & Harrison, P.D. (1995): based their research on Marsh's (1982) SEEQ: Students' Evaluations of Educational Quality that empirically measures students' evaluations of teacher effectiveness on a 35-item nine point scale. 229 university students studying education, accounting, and geology were asked to rate the statements on a scale from 1 (very poor) to 9 (very good). The students were also asked to base their answers on a hypothetical instructor.

Findings: The amount university students learned in a class received the highest overall rating in judging teacher effectiveness. The three groups of students placed little value in course difficulty for determining teacher effectiveness as long as there was a perception of significant learning taking place. It was also found that students studying at a higher level (graduate-level) were more concerned about learning.

The Personal Intelligences & Teacher Effectiveness Research

Table A: The Personal Intelligences as Represented in Teacher Effectiveness Research

Number of Studies	School Level	Research Methods	Instructional Techniques	Teacher Qualities
11 out of 12	*Elementary: 7 *Middle: 4 *Secondary: 3 *University: 4	*Process-Product: 3 *Student Evaluations: 4 *Teacher Self-Evaluations: 3 *Principal Evaluations of Teacher Effectiveness: 1 *Interviews: 2 *Ethnography: 1	*use of journals, motivation, counseling skills, interaction with students, and class discussions	*sense of others, sense of self (positive), humanistic qualities including: caring, friendly, attentive, self-sacrificing, empathy, rapport, personal interaction, reflective listening, relationships with students, dignifying errors to promote learning, psychological environment (care and respect)

Description of Findings

The personal intelligences was highly represented in teacher effectiveness research. Not only did 11 out of the 12 studies (Buntrock-Brodney, 1993; Burrell, 1994; Cloer and Alexander, 1992; Comedena, et al., 1990; Currie, 1985; Delso, 1986; Kondrat, 1989; Ocepek, 1993; Patrick and Smart, 1998; Percy, 1990; Ryan and Harrison, 1995) have significant elements of the personal intelligences in them, the personal intelligences were also highly represented in research methodologies. The spectrum of research methodologies used to analyze and explore the personal intelligences can function as a beacon for future research in teacher effectiveness in the other intelligence areas. The more research methodologies used, the better perspective the researcher will have in creating a holistic picture of what it means to be an effective teacher.

Researchers, in almost every study, (Buntrock-Brodney, 1993; Burrell, 1994; Cloer and Alexander, 1992; Comedena, et al., 1990; Currie, 1985; Delso, 1986; Kondrat, 1989; Ocepek, 1993; Patrick and Smart, 1998; Percy, 1990; Ryan and Harrison, 1995) emphasized the value of personal intelligences' teaching techniques and teacher qualities. The social skills of the teacher appear to have just as an important role as the teaching of the curriculum in teacher effectiveness studies. These skills are modeled time and again in the classrooms of effective teachers; thus, teaching their students how to improve their own interactive skills.

### Verbal-Linguistic Intelligence & Teacher Effectiveness Research

Table B: Verbal-Linguistic Intelligence as Represented in Teacher Effectiveness Research

Number of Studies	School Level	Research Methods	Instructional Techniques	Teacher Qualities
6 out of 10	*Elementary: 3 *Middle: 2 *Secondary: 1 *University: 3	*Process-Product: 2 *Student Evaluations: 3 *Teacher Self-Evaluations: 1 *Teacher Evaluations of Effective Teaching: 1	*use of journals, explains clearly, clear instructions, verbal instruction, and students describe what they've learned	*none represented

### Description of Findings

Verbal-Linguistic Intelligence was found to have a high representation in teacher effectiveness research (Buntrock-Brodney, 1993; Comedena, et al., 1990; Currie, 1985; Dickey, 1988; Ocepek, 1993; Ryan and Harrison, 1995). However, this representation is misleading because most of the measures and themes involved instructional technique of giving directions



clearly. The teacher's ability to articulate and provide clarity in learning expectations is of importance and the research on teacher effectiveness indicates this. The concentration of research conducted in this intelligence has its highest representation at the polar ends of education levels, namely at the elementary and university levels.

### Bodily-Kinesthetic Intelligence & Teacher Effectiveness Research

Table C: Bodily-Kinesthetic Intelligence as Represented in Teacher Effectiveness Research

Number of Studies	School Level	Research Methods	Instructional Techniques	Teacher Qualities
5 out of 10	*Elementary: 3 *Middle: 2 *Secondary: 1 *University: 2	*Process-Product: 2 *Student Evaluations: 2 *Teacher Self-Evaluations: 1 *Teacher Evaluations of Effective Teaching: 1	*ear-to-hand skills, kinesthetic response, moving deliberately throughout the room	*teacher enthusiasm

### Description of Findings

Teacher effectiveness appears to overlook the importance of the kinesthetic elements in teaching. Despite an extensive search by the researcher, no physical education class studies on teacher effectiveness research were found. However, bodily-kinesthetic intelligence should not be strictly relegated to a subject specific area like physical education class. Maintaining a healthy and active lifestyle should be an important part of any culture, and yet, bodily-active teaching techniques are not significantly represented in teacher effectiveness research.

Logical-Mathematical Intelligence & Teacher Effectiveness Research

Table D: Logical-Mathematical Intelligence as Represented in Teacher Effectiveness Research

Number of Studies	School Level	Research Methods	Instructional Techniques	Teacher Qualities
4 out of 12	Elementary: 3 Middle: 0 Secondary: 1 University: 1	*Process-Product: 2 *Student Evaluations: 2 *Teacher Evaluations of Effective Teaching: 1	*questioning, set induction (ability to structure a lesson), use of organizers, reviews learning expectations (objectives), presentation skills, problem-solving, and decision-making	*none represented

Description of Findings

Being a foundation of the traditional educational system, Logical-Mathematical intelligence was represented poorly in teacher effectiveness research (Buntrock-Brodney, 1993; Ocepek, 1993; Patrick and Smart, 1998; Percy, 1990). Those that were studied had a limited scope in relying more on the instructional techniques employed by teachers and their ability to place learning in sequential patterns for the students. The systematic manner is valued as a teaching tool; however, logical-mathematical intelligence had a poor representation in teacher effectiveness research considering this intelligence is one of the most valued in receiving a traditional education.

Some areas that teacher effectiveness research missed were including the teacher's ability to include deductive/inductive reasoning skills and the process of inquiry that are logical

processes that can be used by effectively teachers. These are universal skills that teacher effectiveness research needs to recognize.

The researcher found it surprising that in such a stressed area of traditional views of intelligence, that the logical-mathematical intelligence had such a small representation. Perhaps this stems from the methods employed to look for elements of logical-mathematical intelligence.

### Musical-Rhythmic Intelligence & Teacher Effectiveness Research

Table E: Musical-Rhythmic Intelligence as Represented in Teacher Effectiveness Research

Number of Studies	School Level	Research Methods	Instructional Techniques	Teacher Qualities
2 out of 12	*Elementary: 1 *Middle: 1	*Process-Product: 1 *Teacher Evaluations of Effective Teaching: 1	*shifts sensory channels, music discrimination skills	*none represented

### Description of Findings

Musical-Rhythmic intelligence elements in teacher effectiveness is clearly under-represented (Dickey, 1988; Ocepek, 1993). Music is universal and is a common denominator shared amongst people. Music appreciation can be a unifying and a soothing force in the classroom. One of the studies on teacher effectiveness was specifically in a music class. The musical elements of teaching is undervalued by its lack of representation as an instructional technique and a teacher quality in teacher effectiveness research. If music is a prevailing force in our culture, it does not appear to play an appreciable role in our understanding of an effective teacher. Moreover, innovative methods of integrating music into the curriculum are not

displayed in teacher effectiveness research.

Visual-Spatial Intelligence & Teacher Effectiveness Research

Table F: Visual-Spatial Intelligence as Represented in Teacher Effectiveness Research

Number of Studies	School Level	Research Methods	Instructional Techniques	Teacher Qualities
2 out of 12	*Elementary: 1 *Middle: 1	*Process-Product: 1 *Teacher Evaluations of Effective Teaching: 1	*using classroom artifacts, using different sensory channels, using multi-media (stimulus variation), visually modeling instruction	*none represented

Description of Findings

Very few studies in teacher effectiveness research dealt with the visual spatial intelligence (Dickey, 1988; Ocepek, 1993). Despite a lot of good teaching techniques in this intelligence area, it is not being represented in teacher effectiveness data. Researchers have failed to incorporate this in their studies. Teacher effectiveness research appears to explore the visual ways to stimulate the student including the use of classroom artefacts, shifting sensory presentation of the material and using multi-media effectively.

Naturalist Intelligence & Teacher Effectiveness Research

*Table G: Naturalist Intelligence as Represented in Teacher Effectiveness Research*

<i>Number of Studies</i>	<i>School Level</i>	<i>Research Methods</i>	<i>Instructional Techniques</i>	<i>Teacher Qualities</i>
1 out of 12	*Elementary: 1	*Interviews: 1 *Ethnography: 1	*extending students' thinking skills	*none represented

Description of Findings

The naturalist intelligence has a very limited showing in teacher effectiveness research (Kondrat, 1989). Perhaps this is because most of the elements of naturalist intelligence are not represented in the traditional classroom. Experiential learning environments are one example of research that would have many elements of the naturalist intelligence. Interestingly, only the qualitative research methods of an ethnography and using interviews drew out the naturalist intelligence elements in the one study.

Two reasons may account for this discrepancy. The naturalist intelligence represents a new area of study in intelligence; however, none of the selected studies had direct references to the theory of multiple intelligences and, therefore, this can not be a reliable factor. The other reason for this lack of representation could be because naturalist intelligence instructional techniques and teacher characteristics occur outside of the traditional classroom, such as in an experiential education program where students are exposed to the elements in nature.

Table 5:

MI Dimensions in Teacher Effectiveness Research

\*\*\*Under Measures/Themes heading *italicized words denote teacher qualities*

<u>Study</u>	<u>Research Method(s)</u>	<u>School Level</u>	<u>Intelligence(s)</u>	<u>Measures/Themes</u>
Buntrock-Brodney, S. (1993)	*Process-Product *Student Evaluations	Elementary	Linguistic/Personal Logical Kinesthetic	-use of journals -mathematics class (subject) -enthusiasm
Burrell, D.L. (1994)	*Process-Product	Middle	Personal	-locus of control -efficacy
Cloer, T.; Alexander, W.A. (1992)	*Teacher Self Evaluations *Principal Evaluations of teachers	Elementary Middle Secondary	Personal	-pupil control ideologies -humanistic qualities
Comadena, ME, et al. (1990)	*Student Evaluations	University	Personal  Linguistic	-friendly, attentive -motivation -explains clearly
Currie, D.G. (1985)	*Teacher Self Evaluations	Elementary Middle Secondary University	Kinesthetic Personal Linguistic	-enthusiasm -positive self concept -clear directions
Deleo, D.L. (1986)	*Interviews	Elementary	Personal	-counseling & motivation skills -relationships with students, caring, self-sacrificing
Dickey, D.R. (1988)	*Process-Product	Middle	Kinesthetic Musical Visual Linguistic	-ear-to-hand skills, kinesthetic response -music discrimination skills (music class) -visually modeling instruction -verbal instruction

<u>Study</u>	<u>Research Method(s)</u>	<u>School Level</u>	<u>Intelligence(s)</u>	<u>Measures/Themes</u>
Kondrat, D.C. (1989)	*Ethnography *Interviews	Elementary	Personal  Naturalist	-motivation, <i>dignifying errors to promote learning, building relationships</i> -extending students' thinking
Ocepek, L.S. (1993)	*Teacher Evaluations of effective teaching	Elementary	Personal  Kinesthetic Logical  Spat/Mus/Pers/Kin Linguistic/Personal	-psychological environment -using different interaction styles -enthusiasm -questioning -set induction: ability to structure lesson -stimulus variation -closure
Patrick, J; Smart, R.M. (1998)	*Student Evaluations	University	Personal Logical	-respect for students -presentation skills
Percy, R.L. (1990)	*Process-Product	Elementary  Secondary	Personal  Logical	-empathy, rapport, personal interaction with students, reflective listening -problem-solving, decision-making
Ryan, J.M.; Harrison, P.D. (1995)	*Student Evaluations (Hypothetical)	University	Kinesthetic Personal  Linguistic	-enthusiasm -group interaction, individual rapport -clear explanations

### MI Findings in Teacher Effectiveness Research

*As demonstrated in the graph [see Table 6], the personal intelligences ranked the highest in MI representation on teacher effectiveness research in both instructional techniques and teacher characteristics (Buntrock-Brodney, 1993; Burrell, 1994; Cloer and Alexander, 1992; Comedena, et al., 1990; Currie, 1985; Delso, 1986; Kondrat, 1989; Ocepek, 1993; Patrick and Smart, 1998; Percy, 1990; Ryan and Harrison, 1995). Although traditional schooling views have placed emphasis on the verbal-linguistic and logical mathematical intelligences, in teacher effectiveness research the personal intelligences have an overwhelming representation. Perhaps this is for good reason. What effective teachers do in the way of supporting and caring for their students, the way they reach out and build trust and mutual respect, and how they engage and encourage their students to grow and become their best possible selves is an element that can be overlooked by people involved in roles outside of the classroom (Ocepek, 1993). In this connection, teaching is no longer confined to a set of goals, or only to some content and skills, rather it incorporates values and virtues that are somewhat oblique and hard to explain. In addition, the personal aspects of good teaching find the teacher negotiating social problems and situations that arise in their students' personal lives to teach their students effectively. This aspect of effective teaching where the teacher is able to relate to the student on a personal level improves the possibility of teaching the students more effectively. Good teachers spend time doing more than merely presenting subject material to their students (Delso, 1993). Yet, most research seeks to understand at least some elements of the personal intelligences. If any of the intelligences was to have an abundant representation, this one is most intangible*



element representing what the teacher brings to the classroom. Of any of the intelligences to concentrate on, this one is perhaps the hardest to measure or examine and yet it is most represented.

One universal theme revealed in Ocepek (1993), is the ability of the teacher to allow students the opportunity to express themselves in a variety of ways. However, it appears that the researcher has to be present in the actual classroom to evaluate this in the form of an ethnographic study.

Other intelligences with moderate representation in teacher effectiveness research include verbal-linguistic intelligence with 6 out of 12 studies (Buntrock-Brodney, 1993; Comedena, et al., 1990; Currie, 1985; Dickey, 1988; Ocepek, 1993; Ryan and Harrison, 1995) although this is misleading with most of this representation stemming from the teacher's ability to articulate instructions clearly, bodily-kinesthetic with 5 out of 12 studies (Buntrock-Brodney, 1993; Currie, 1985; Dickey, 1988; Ocepek, 1993; Ryan and Harrison, 1995), and logical mathematical intelligence with representation in 4 out of 12 studies (Buntrock-Brodney, 1993; Ocepek, 1993; Patrick and Smart, 1998; Percy, 1990).

The intelligences that showed inadequate representation in teacher effectiveness research include the following: musical-rhythmic (Dickey, 1988; Ocepek, 1993) and visual-spatial (Dickey, 1988; Ocepek, 1993) intelligences with merely 2 out of 12 studies, and the naturalist intelligence with only 1 out of the 12 studies (Kondrat, 1989).

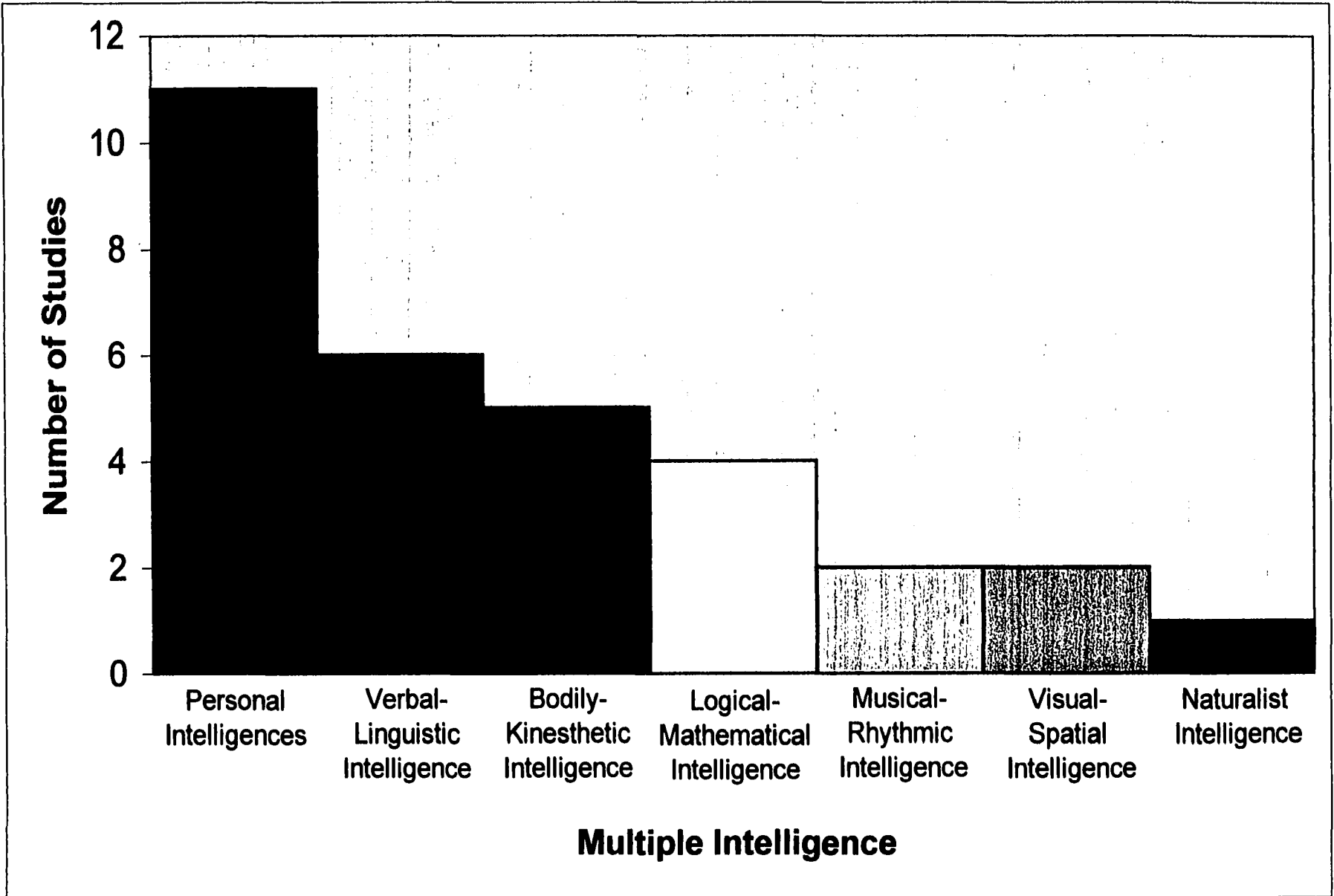
The findings indicate that teacher effectiveness is measured and analyzed in a number of ways. However, when this research is analyzed through using MI theory, most research focuses

*on the personal intelligence at the expense of others. If researchers truly desire to understand what it means to be an effective teacher, then a new conceptualization in research strategy is required.*

*The chart is a reflection of the current status of MI theory representation in teacher effectiveness research. Future studies need to be done to ensure that the diverse means teachers facilitate and encourage learning are accounted for. Having a multiple intelligences research methodology on teacher effectiveness could help both researchers and teachers better understand the nature of effective teaching as well as be an aid in improving teaching through being able to provide a broader picture of what effective teaching is.*

Table 6:

MI Elements in Teacher Effectiveness Research (Bar Graph)



## CHAPTER V. DISCUSSION AND CONCLUSION

*This research evaluated twelve studies (Buntrock-Brodney, 1993; Burrell, 1994; Cloer and Alexander, 1992; Comadena, et al., 1990; Currie, 1985; Delso, 1986; Dickey, 1988; Kondrat, 1989; Ocepek, 1993; Patrick and Smart, 1998; Percy, 1990; Ryan and Harrison, 1995) on teacher effectiveness using a MI theory lens. Research methodologies of the twelve selected studies on teacher effectiveness encompassed process-product research (Buntrock-Brodney, 1993; Burrell, 1994; Dickey, 1988; Percy, 1990), evaluation studies (Buntrock-Brodney, 1993; Cloer and Alexander, 1992; Comadena, et al, 1990; Currie, 1985; Ocepek, 1993; Patrick and Smart, 1998; Ryan and Harrison, 1995) and qualitative research techniques such as an ethnography (Kondrat, 1989) and the use of interviews (Delso, 1986; Kondrat, 1989). Table 3 became the lens to examine the degree of MI theory representation in the twelve studies.*

### Discussion of Findings

*The analysis revealed a large discrepancy between the intelligences and their representation in teacher effectiveness research. Interpretation of the numbers reveals that there is no clear balance in what is being measured or has emerged as themes in teacher effectiveness research. The imbalance occurred at two ends of the spectrum with 11 out of the 12 studies (Buntrock-Brodney, 1993; Burrell, 1994; Cloer and Alexander, 1992; Comadena, et al., 1990; Currie, 1985; Delso, 1986; Kondrat, 1989; Ocepek, 1993; Patrick and Smart, 1998; Percy, 1990; Ryan and Harrison, 1995) evaluating the personal intelligences while only 1 out of the 12 (Kondrat, 1989) evaluated the naturalist intelligence. Verbal-linguistic intelligence was the*

*second highest represented intelligence being represented in 6 out of the 12 studies (Buntrock-Brodney, 1993; Comedena, et al., 1990; Currie, 1985; Dickey, 1988; Ocepek, 1993; Ryan and Harrison, 1995) while the bodily-kinesthetic (Buntrock-Brodney, 1993; Currie, 1985; Dickey, 1988; Ocepek, 1993; Ryan and Harrison, 1995) and logical-mathematical intelligences (Buntrock-Brodney, 1993; Ocepek, 1993; Patrick and Smart, 1998; Percy, 1990) were represented in 5 and 4 out of the 12 studies respectively. Studies containing teacher qualities or instructional techniques of musical-rhythmic and visual-spatial intelligences were highly under-represented with only 2 out of the 12 studies (Dickey, 1988; Ocepek, 1993) containing these intelligence elements.*

### Conclusions

*Analysis of the findings led to conclusions regarding the representation of MI components in teacher effectiveness research. Using MI theory is an appropriate method for assessing teacher effectiveness because it helps researchers, administrators, parents, students, faculties of education and teachers themselves to have a more holistic understanding of the dynamism of what it means to be an effective teacher. Through utilizing a MI lens in addressing teacher effectiveness, people in general will have a better view of the qualities and instructional techniques of the classroom teacher. Teachers who are aware of MI theory and recognize the theories' benefits are better able to adapt the curriculum to suit individual needs. In addition, a practical approach to teacher testing could be adopted through making use of a MI framework. The nature of the school organizational structure can also incorporate elements of MI theory to aid in the education of students.*

### *Creating a Balance in Teacher Effectiveness Research*

*There is a current need for creating a balance in our understanding of the effective teacher. The personal intelligences are currently the most crucial element present in teacher effectiveness literature. Analysis of the studies reveals that the demeanor and instructional techniques of the teacher are highly valued measures when used to assess teacher effectiveness. The personal qualities of a teacher also represent something that is an intangible element in teaching and would be difficult to analyze unless qualitative research methods are employed.*

*The other intelligence areas have representation; however, they are not used nearly as much as indicators of effective teaching. This leads the researcher to argue that a more holistic view of teacher effectiveness is necessary in future teacher effectiveness studies. A balance in future research on effective teaching is desired because it will lead to a more comprehensive conception of what it means to be an effective teacher. It will also provide a better view of the qualities and instructional techniques teachers use on a regular basis to promote learning. In addition, such future research will be a valuable asset to the classroom teacher who will be more aware and be able to recognize the changing needs of the student. Children enter the classroom with learning gifts and problems. Therefore, the classroom teacher is in need of a variety of teaching approaches to help facilitate the learning process. Adopting a MI-based approach will help teachers to recognize and to adjust their teaching expertise so that all students will be able to learn confidently.*

### *A MI View of the Teacher*

*The purpose of teacher effectiveness research is to look for the elements that make people successful educators. Utilizing a MI framework like that of the one outlined in this study is a helpful tool to make the classroom teacher more aware and better able to recognize the ingredients of effective teaching by being able to address the variety of different learners in the classroom and to allow each of these learners to excel. Teachers who are aware and who are able to recognize the different learners in their classrooms will be more effective teachers. Awareness of MI theory by teachers can also promote creating a 'safe and caring' learning environment through this insight into human difference. Administering assignments and assessments that suit the variety of learners will help to maximize the learning potential in students. By being taught in a manner that suits a variety of students' needs, MI theory provides teachers with more tools in their tool kit. The researcher also feels that these students become better citizens who are equipped to deal with the challenges of an increasingly diverse society.*

*Of concern for teachers, however, is the amount of time teachers have to implement MI instructional and assessment strategies into their unit plans. With the current debate over teacher preparation time occurring in Ontario with the government desiring to increase high school teachers' workloads, the ability for the teacher to modify and expand the curriculum to suit individual needs is compromised.*

### *MI Teacher Testing*

*The question of teacher testing has become a reality in Ontario. Instead of fighting such tests, educators should be asking how to make the most use of it. If new tests are to be designed, they must be non-threatening and relative to all teachers, and yet address the question of whether an educator is an effective teacher. Utilizing a MI approach to teacher testing could create a balanced test that shows the dimensions and dynamics a teacher brings to the classroom. Lobbying the Ontario College of Teachers to ensure MI theory permeates itself in every discussion and policy is an important step to creating a quality measure of judging teacher effectiveness.*

*Any teacher test that is created must allow for teachers to show an awareness of all the elements of the curriculum. In addition, a test for teachers must allow for the teacher to have responsibility for identifying and recognizing how students best learn. A test, therefore, must be able to show how the teacher is making use of the curriculum and how she is making appropriate adjustments to her teaching styles in order to accommodate individual needs.*

*A possible model for teacher testing could ask the teacher to describe a unit plan that addresses each of the eight intelligences. Such a test is straight-forward and would allow teachers to demonstrate their awareness of the curriculum, ability to adapt the curriculum for individual needs, and would allow teachers to show their ability to adjust instructional styles appropriately in such an important way despite the imposition of a teacher test.*

*The ultimate goal of this thesis is to have MI permeate throughout the educational system. The role of the faculties of education represents a starting point to help future*



*teachers understand the diverse ways in which people learn. MI should be fundamentally ingrained into the consciousness of the educational institutions because they are spawning the next generation of educators. For this reason, this thesis is important because MI awareness begins in the faculties of education. Every discussion and policy made in consultation between the Ontario College of Teachers and the faculties of education should have a MI representation when addressing curriculum issues.*

*Work in the faculty of education to help develop MI awareness in future teachers can be accomplished successfully. Faculty professors can play a vital role in accomplishing this task. The seeds of MI awareness can be planted by faculty of education professors by allowing the prospective teachers examine the curriculum and prepare a lesson or unit plan that is inclusive of multiple intelligences theory. For example, in creating a lesson on WWI, the prospective teachers could have students in the class arranged into groups that are representative of the major countries involved in the conflict: each group would represent a different country that was involved in WWI. The requirement of each group would be to prepare and present their country's purpose, policy, and strategy in the Great War. Each group would choose from a list of MI-based methods of how they would present their country's information. A rubric that would outline how the group would be assessed would also be provided to each group that would be MI fair in light of the different ways each group would choose to present their information.*

#### ***Alternative Approaches to School Organization***

*The present structure of school organizations could benefit from MI possibilities. One idea could be to develop a model where not only teachers, but the organizational structure would*

reflect a MI consciousness. So how could schools be best organized in their internal structure to maximize student learning experiences? One model would be to organize the school staff into rotating teachers who would teach different classes with a model like that of most high schools in Ontario. Students could benefit from this arrangement by having teachers with different qualities and instructional techniques to provide the students with a broader spectrum of learning experiences.

### *MI Theory in the Curriculum*

MI theory contains within it inherent benefits that relate to the curriculum. These benefits include the following: a) helps students to understand their abilities and the abilities of those around them; b) shows students how to use their strengths both to learn and to work on their weaknesses; c) builds confidence to begin taking risks; d) provides for unforgettable learning, thereby helping students to learn more (Silver, Strong, & Perini, 1997). The new Ontario curriculum compel educators to make use of educational theories and research. As indicated in the new Ontario Senior Curriculum, multiple teaching approaches are an integral component:

*Since no single instructional approach can address all the curriculum expectations or meet all the needs of each learner, teachers should select instructional strategies and classroom activities that are based on an assessment of students' needs, proven learning theory, and best practices. (The Ontario Curriculum, Grades 11 and 12: English 2000, p. 7)*

As indicated in the above guideline, educators are being urged to look for educational practices that can enhance learning. Anytime we, as educators, are not doing this, we are not effective.

### Implications

*It is the hope of the researcher that a balance corresponding to the multiple intelligences be established in teacher effectiveness research in order to have a more thorough understanding of effective teachers. If a balance is desired in understanding the nature of what it means to be an effective teacher, then the question of how is it best to encourage teachers to look in a MI direction arises. Active intervention of permeating MI into teacher effectiveness research to ensure quality teaching should be considered; it should be looked at through faculties of education, inservice teaching placements, and in the regular classroom.*

### Suggestions for Further Research

*This research has identified salient areas in teacher effectiveness studies in addition to describing areas that have a thorough representation. Future teacher effectiveness research needs to involve all aspects of intelligence. The effective teacher operates a classroom that utilizes a variety of approaches, but researchers appear not to be recognizing the full scope of effective teaching. Research in effective teaching needs to investigate further the diverse ways a teacher reaches students.*

*Future studies focusing on just one of the under-represented intelligences and establishing it as the key research framework would be an interesting area of research. The researcher in such a study would keep the course content and learning expectations in correspondence with the curriculum, but would adapt instructional techniques towards one type of intelligence. A control group should be established to allow researchers to analyze, test and assess results in order to compare the two groups.*

*Another area for future research would be to employ mixed research methodologies. By using a multiple approach to gathering research data, a more holistic picture might be developed that adheres to understanding effective teaching from a MI theory bearing.*

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