

A Comparison of Multiple Intelligences Profile of Students with and without Learning Disabilities

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Abstract An alternative perspective of learning disabilities has emerged from cognitive or neurological deficit to cognitive and learning differences. In the present research, multiple intelligences profiles of students with and without learning disabilities (LD) were compared. Research sample comprised of 60 LD and non-LD students from fourth, fifth, and sixth grades, using available and stratified random sampling respectively. Each student in the LD group had previously received a diagnosis of learning disabilities by a specialist, and non-LD students had no reported history of academic difficulties. Groups were matched in terms of sex and grade. Research method was casual-comparative. "Multiple Intelligences Developmental Assessment Scale" (MIDAS-Kids) was used as the tool of data collection. Descriptive and inferential statistics were used to analyze the data. Results showed: The Musical ($t=0.88$, $p<.001$); Bodily/Kinesthetic ($t=0.709$, $p<.48$); Intrapersonal ($t=1.186$, $p<.001$); and Natural intelligence ($t=0.598$, $p<.001$) scores in two groups showed no significant difference. The Linguistic ($t=8.212$, $p<.001$); Logical/ Mathematical ($t=8.358$, $p<.001$); and Interpersonal intelligence ($t=2.422$, $p<.001$); scores in students without LD were significantly higher than students with LD. The Spatial intelligence ($t=6.198$, $p<.001$); scores in LD students were significantly higher than the regular students. The usefulness of research findings is discussed in relation to possible implications for assessment and educational interventions for students with LD.

Keywords Learning disabilities, Multiple intelligences, MIDAS

1. Introduction

The term learning disabilities (LD) is associated with the concept of unexpected underachievement – specifically, for the students who do not listen, speak, read, write or develop mathematics skills commensurate with their potentiality even though there has been adequate opportunity to learn (Lyon, et. al., 2011, p.261; Lyon, 1996). Most students affected by LD have average to above-average intelligence, with no sensory impairments, but have difficulties in academic learning and performance that makes them lag behind their peers (Kenyon, 2003). Shaywitz, Shaywitz, & Escobar (1990), have reported the prevalence estimates to vary from 3% to 7%, whereas according to Seif Naraghi and Naderi, about 8% of Iranian student population suffers from Learning disabilities (Seif Naraghi, & Naderi, 2010). Major types of LD include: reading disability (dyslexia), writing disability (dysgraphia), mathematics disability (dyscalculia), and motor skills disability (dyspraxia). In recent research an alternative perspective of LD has emerged from cognitive or neurological deficit to cognitive and learning differences

(Geschwind, 1982; Gordon, 1983; Davis, & Braun, 1997; Silverman, 1989, 2002; von Karolyi, 2001; von Karolyi, Winner, Gray, & Sherman, 2003; Mann, 2006; Rowan, 2010; Amesbury, 2006; Hearne, & Stone, 1995). Despite calls for learner-centered instruction, specifically for students with special needs, the typical school instruction is highly teacher-centered and non-interactive. Assignments and Activities are usually subject specific with text-based instruction and an emphasis on step-by-step learning, lectures, and verbally based assessments. The sequential structure of many classrooms places an extra burden on non-verbal learners (e.g. visual-spatial) as they struggle to adapt to classroom expectations (Mann, 2006; Davis, & Braun, 1997; Silverman, 1989, 2002). Schools are deficit driven; they generally devalue or ignore intelligences other than the logical-mathematical and linguistic. Moreover they falsely assume that one's general success in all areas is tied to one's development in these two specified areas (Hearne, & Stone, 1995). The 50% dropout rate of high school students shows the traditional mode of teaching, which is termed chalk and talk or frontal lobe teaching, has not been successful for all students [Snyder, 1999, cited in McClellan, & Conti, 2008]. Although less research has been conducted on visual-spatial learning compared to verbal learning, there are many indications of how the individual differences affect students' learning from visual and verbal instructions (Davis,

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& Braun, 1997; Silverman, 1989, 2002). Spatial ability and visual thinking are closely related but are not a single entity; consequently, there is no one specific pattern of characteristics that will manifest itself in learners with spatial talents (Dixon, 1983; Olson, 1984, as cited in Mann, 2006). Students with verbal deficiencies and non-verbal strengths rarely have the opportunity to demonstrate their talents in academic settings. Developing skills in areas of weakness should be approached through the student's identified strengths and passions. This is best accomplished by differentiating the curriculum to focus on areas of strengths and talents, rather than concentrating on deficiencies. Strengths-based learning and skills development not only leads to academic gains but also to social and emotional improvement (Olenchak & Reis, as cited in Mann, 2006).

Differentiated instruction (DI) is based on the teaching philosophy that teachers should adapt instruction to student differences (Beam, 2009). Tomlinson believes when students are diverse, teachers should adjust their instruction to meet students' varying readiness levels, interests, and learning preferences, rather than marching them through the preplanned curriculum in lock steps. Multiple intelligences (MI), as one approach to differentiating, are very important components that seem to get neglected in the whole "differentiation thrust". Without careful consideration of learning needs of each student, it is pointless to consider methods of alternative instruction (Tomlinson, 1999, 2004; Willis, & Mann, 2000).

One of the Pedagogical practices that are often cited to be potentially facilitative for inclusion of students with developmental disabilities is Gardner's theory of multiple intelligences (Armstrong, 2009). In his book, *Frames of Mind*, Gardner (Gardner, 1993) challenged the narrowly defined notion of intelligence, and proposed the existence of seven different intelligences, to which he recently added an eighth and discussed the possibility of a ninth (Armstrong, 2009; Gardner, 1999). The following are the learning characteristics based upon multiple intelligences. Logical-Mathematical Intelligence involves the elevated skill of manipulating and understanding numbers, to carry out mathematical operations logically and analytically, and the ability to reason effectively. Verbal/Linguistic Intelligence is the ability to understand, use, and manipulate written or spoken words productively, as well as the ability to learn new languages. Visual/Spatial Intelligence is characterized by being able to see an image, recognize both large and small visual patterns or situations and quickly assess areas that could be changed to transform or improve the appearance. People who are high in this ability tend to think in pictures and create vivid mental images to retain information. They enjoy dealing with visual stimuli and will probably work in positions that emphasize their visualization skills. Bodily/Kinesthetic Intelligence is the proficiency of using the entire or parts of the body to express ideas and feelings and the competence of using the body to produce or transform things. Musical Intelligence is the ability to

appreciate, distinguish, compose, and perform in various musical forms. Intrapersonal Intelligence is having a positive self-concept and life direction, which is intrinsically grounded. This is the competency in knowing oneself and acting to modify the self, based on that knowledge. Interpersonal Intelligence is the proficiency of an individual in perceiving the moods, aims, motivations, desires and emotions of others. Naturalistic Intelligence is the ability to appreciate, categorize, classify, explain, and connect to things encountered in nature (Armstrong, 2009). MI theory proposes that the eight intelligence domains are theoretically independent, but Gardner has acknowledged that two or more could overlap (Gardner, 1999). He cautioned, however, that correlations among subtests of standardized intelligence tests occur because the tasks all rely on rapid responses to items that are heavily based on linguistic and logical/mathematical abilities. The theory suggests that two human intelligences, verbal/linguistic and logical-mathematical intelligence, have dominated in traditional schooling. An assumption of MI theory is that a child with poor performance in, math and/or reading has just as great a chance as anyone else at being successful in music, art, physical education, or even geography, as everyone could be smart in some way. The five non-traditional intelligences—spatial, musical, bodily-kinesthetic, interpersonal and intrapersonal – have generally been overlooked. The less recognized type of student is the one who has spatial intelligence. Gardner has expressed concern over the "verbal lens"—that is, assessing all aspects of intelligence through the use of a common verbal format (Visser, Ashton, & Vernon, 2006). Learners need to experience learning that allows them to engage all of their intelligences, and how they can impact their learning. They need to have a choice and voice in how they learn and are assessed. Students are then more likely to experience curriculum that is meaningful, interesting, personalized, and relevant.

According to Green, MI is a way of thinking, an attitude about people's similarities and differences, a guide for inclusion and enrichment, enhancing the self-esteem and developing respect for the uniqueness of every child (Green, 1998). Green believes incorporating MI in the curriculum for students with LD provides them greater opportunity to learn and succeed, as they have been educated in a system that has failed them for too long. They can learn through their strengths. Being able to learn differently, develops a sense of accomplishment, which helps to improve their abilities in weaker areas too. They can show and share their strengths with other students which lead to a sense of understanding and respect for them. MI-based curriculum not only accommodates learning differences, but also has a more open-ended approach to assessment, through individual projects, creative tasks, student journal, etc., which allows the students with learning problems to use their own way of demonstrating their learning.

The aim of present research was to study the differences of MI profile-if any-among students with and without learning disabilities, to get a clearer picture of the relative strengths

and weaknesses. Which in turn will provide some insights for educators, to plan assessment and educational intervention programs to suit the particular needs of students with LD.

Research questions were:

- Is the MI profile of students with and without learning disabilities different?
- If there is a difference, in which intelligences are they different?

2. Method

Participants

Participants included two groups of students from the fourth to the sixth grade. Each group consisted of thirty students. Each student in the LD group had previously received a diagnosis of learning disabilities from a learning disabilities center affiliated with the special education organization. The LD group consisted of 8 females, and 22 males whose ages ranged from 9 years and 10 months to 12 years and 7 months, with the Mean chronological age of 11.3. They attended public schools, and were referred to LD centers for extra special educational help and support services. 30 non-LD students were selected using random stratified sampling from the same geographical locations to obtain a matched group in terms of socio-economic backgrounds. The control group of 8 females and 22 males had no reported history of academic difficulties, which was confirmed by school assessments. Their age ranged from 9 years and 8 months to 12 years and 5 months, with the Mean chronological age of 11.1. The students of the two groups attended public schools, and were almost homogeneous in terms of age, grade, and gender, and had no known physical or sensory difficulties.

Measures

The instrument used in this research to measure students' MI was Shearer's Multiple Intelligences Developmental Assessment Scale (MIDAS). The scales were developed in 1987 based on Gardner's description of each of the intelligence's content. The MIDAS is a self or other completed questionnaire that can be easily administered and interpreted by teachers and counselors. The assumption is that multiple intelligence disposition can be reasonably described by way of self or knowledgeable other reporting through the careful use and interpretation of the MIDAS Profile. The MIDAS-KIDS for children (grades K through 8th) has undergone development since 1994 and was recently validated on a sample of 2,200 children (Shearer, 2001). The MIDAS-KIDS has been adapted and customized culturally in Iran with 93 items ($r=0.87$, Saeidi, 2011). It inquires about developed skills, levels of participation and

enthusiasm for a wide variety of activities in daily life. Scales assess students' ability and provide ratings of the propensities of each designated areas. Musical intelligence is assessed by 11 questions with 4 sub-scales: musicality, vocal, appreciation, and instrument. Ten questions are designed to assess bodily/kinesthetic intelligence with 3 sub-scales: physical ability, hands, and dance. Sub-scales for math-logic intelligence are: calculations, and problem solving with 9 questions. Ten questions and 3 sub-scales: constructions, imagery, and artistic assess spatial intelligence. Linguistic intelligence is assessed by 13 questions with 3 sub-scales: reading, writing, and linguistic sensitivity. Sub-scales for interpersonal intelligence are: understanding, leadership, and getting along with others with 13 questions. Fourteen questions and 4 sub-scales: self-Knowledge, goal achievement, effective relationship, and managing feelings assess intrapersonal intelligence. Naturalist intelligence is assessed by 13 questions with 2 sub-scales: earth science, and animal care. The scales were administered and scored using the standardized instructions from the Administration and Scoring Manual for the MIDAS-KIDS (Adapted Version, Saeidi, 2011).

Procedure

Participants were tested in the designated classrooms in their schools. The MIDAS is a self or other completed questionnaire; in this study scales were administered individually in the form of interviews. All participants were given the necessary information as well as an oral description of procedures prior to assessment. Each individual testing session took place over a 1-1.5 h period, with a 10-min break at approximately the halfway point, or whenever required. Each participant was provided with a feedback letter that briefly explained the purpose of the research upon completion of the testing session and a summary of their MIDAS Profile report following the completion of interpretation. A written consent was taken prior to assessments from each participant's parent in both groups either through the LD center or the schools which they were attending.

3. Results

Data analyses showed no significant difference between the two groups in four of the eight intelligences scores: Musical intelligence, Bodily/Kinesthetic intelligence, Intrapersonal intelligence, and Natural intelligence. The Linguistic, Logical/Mathematical, and Interpersonal intelligence scores in students without LD were significantly higher than students with LD. The Spatial intelligence scores in LD students were significantly higher than the regular students. The scores and *t* results of all the sub-scales in LD and non-LD students are presented in Table 1.

Table 1. Scores and *t* test results of the four different intelligences in LD and non-LD students

Intelligences	Mean and (SD)		<i>t</i>	Sig	
	Students: LD	Non- LD			
Logical/ Mathematical	Problem- solving	37(12.36)	51.96(14.812)	4.105	.001
	Calculations	30.7(15.6)	68.83(13.62)	10.55	.001
Spatial	Artistic	60(16,58)	40.28(15.64)	4.73	.001
	Constructions	57.5(15.2)	40.83(12.63)	4.649	.001
	Imagery	45.7(13.3)	37.54(12.69)	2.429	.019
Interpersonal	Understanding	48.9 (15.31)	54.79(10.46)	1.722	.009
	Leadership	42.78(13.18)	51.25(13.39)	2.476	.016
	Getting along- with others	49.44(16.36)	59.58(18.47)	2.250	.002
Linguistic	Reading	31.67(18.49)	74.58(18.99)	8.86	.001
	Writing	27.08(17.70)	47.50(19.80)	4.21	.001
	Linguistic- sensitivity	43.75(17.46)	56.81(12.49)	3.33	.002

4. Discussion

Students with learning disabilities have long been receiving inappropriate labels and treatment, because of their learning differences. Their incredible talents generally underestimated and undervalued or not well represented in the curricula. Rote memorization, forced oral reading, text-based instruction, and use of teacher-directed activities are teaching strategies that appear to be unsuccessful in teaching students with verbal deficiencies and non-verbal strengths. Recent research has begun to concentrate on the different and nontraditional strengths and capabilities of individuals with learning disabilities, which so far have not been recognized or highly valued by the schools. Reasonable efforts are being made for a better accommodation of their learning needs, which allows the students to minimize their weaknesses and capitalize on their strength areas. One of the Pedagogical practices that is often cited to be potentially facilitative for inclusion of students with developmental disabilities is Gardner's theory of multiple intelligences. According to Kagan (1998, as cited in Özdemir, Güneysu, & Tekkaya, 2006), MI theory can be adopted for instructions to meet three goals: to match teaching to students' learning; to encourage learners to stretch their abilities and develop all their capabilities as fully as possible; and to honor and celebrate diversity. The analyses of tests measuring the "intelligences" revealed that the Musical, Bodily/Kinesthetic, Intrapersonal, and Natural intelligence scores in two groups showed no significant difference. Results showed: non-LD students were substantially higher in the Linguistic, Logical/ Mathematical, and Interpersonal intelligence scores. According to Hearne and Stone (1995), schools are deficit driven. They generally devalue or ignore intelligences other than the logical-mathematical and linguistic, as they falsely assume that one's general success in all areas is tied to one's development in these two specified areas. LD students have been educated in such a system that has caused them to experience failure for too long. Al-Sabbah, et al., (2011) too asserted that students' high scores at mathematic, linguistic and the kinesthetic intelligences, means that the academic system or the students placed emphasis on these intelligences

as preferable skills compared to the rest of the other intelligences. This implies that the school's curriculum and activities are inclined to focus only on these kinds of intelligence and not on natural and musical intelligences (Al-Sabbah, Al-Sabbah & Abod, 2011). However, not only LD students were no different in four of the eight intelligences, but also the spatial intelligence scores in LD students were significantly higher than the regular students. The findings are in line with the current research that acknowledges the incredible talents of learners with LD, generally undervalued or not well represented in the curricula (Mann, 2006; Davis, & Braun, 1997; Silverman, 1989, 2002; von Karolyi, 2001; Hearne and Stone 1995). Visual-spatial learners are individuals who learn best through discovery or inductive techniques. They excel when involved with manipulative, visual representations, models, and computers. Visual-spatial children remember what they see, so use visuals and hands-on experiences. Imagination, creativity, visualization and pattern finding are their major strengths. Visual-spatial learners should be taught to compensate for sequential weaknesses and poor rote memory. Academic pressure is eased through the use of computers, calculators, tape recorders and audio literature, and digital textbooks (Silverman, 1989, 2002; Tomlinson, 1999, 2004; Willis, & Mann, 2000). The most important implication of the findings is that LD should not be characterized only by deficit, but also by talent. Addressing multiple intelligences of learners is one approach of differentiating, as activities are offered that draw on students' talents in all the intellects. Diversifying the instruction, by incorporating the multiple intelligences, would help students discover their strengths and put a focus on ability rather than disability. Strength-oriented approaches to education, and offering students choices, would help students' interests to be explored and to best accommodate their learning needs.

This study was exploratory in nature, with a small sample, and findings must be considered with caution. A larger sample representative of both the groups are needed to come to any significant conclusions regarding the differences in the multiple intelligences profiles of each group. However, in spite of these limitations, results are encouraging, though future research needs to substantiate these findings. Further

research on more diverse MI-based assessment techniques for LD students is advocated, and experimental research is needed to focus on the educational interventions that align teaching and learning strategies with pupils' learning styles and strengths.

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