

## **Investigating Students with English as a Foreign Language and Their Textbooks: An Application of Multiple Intelligences Theory**

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### **Abstract**

*In the present study, the researchers investigated both English as foreign language (EFL) students and their textbooks using multiple intelligences (MI) theory to identify the type/s of intelligence incorporated in English language teaching (ELT) textbook and whether or not students prefer this/these type/s of intelligence. The participants of this study included 346 teenage students filling Student-Generated Inventory for Secondary Level and Young Adult Learners. Students and their textbooks along with their language proficiency levels were analyzed through multiple intelligences checklist developed by Botelho (2003). The results of the study showed that teaching textbooks are mostly provided for verbal linguistic, interpersonal, visual, spatial, and logical mathematical intelligences. Students, however, preferred all types of intelligences in varying approximate degrees, but among all types of intelligences; interpersonal, and logical mathematical were the students' first preference. While students' English language proficiency levels did not show any significant effect on their multiple intelligence inclinations, English textbooks proficiency levels showed a significant effect on the frequency and application of types of intelligences in textbooks.*

**Keywords:** Multiple intelligences, EFL textbooks, language proficiency level of students/ textbooks, Cognitive Psychology, ELT textbooks, English as Foreign language students, and Psycholinguistics

### **1. Introduction**

Multiple intelligences theory has been introduced and developed by Gardner (1983). It emphasizes individuals' uniqueness, students' different learning styles, and potentials and intelligence profile to answer students' various needs and meet their interests through considering different intelligences. Hence the theory riveted the attention of educationalist, curriculum developers, lesson planners, teachers and textbook designers. Integrated education is an educational system that applies different educational approaches and techniques like; games, music, stories, videos and images to develop students' natural talents (Gardner, 1983). Integrated education also opens more room for creativity and flexibility in preparing teaching materials and lesson plans for teachers (Gardner, 1999).

On the other hand, the importance of textbooks as the main instrument for teachers has been regarded as an important part of teachers' professional knowledge in language teaching (Richards, 2001). Since textbooks are important in language pedagogy, teachers need to consider individuals' differences, styles and needs in choosing teaching textbooks (Garinger, 2001). Researchers such as Richards (2001) and Gardner (1999) suggest using checklists, such as multiple intelligences checklist, and evaluation system to select textbooks.

## 2.1. Multiple Intelligence Theory

The first theoretical attempt in describing the concept of intelligence dates back to Charles Spearman (as cited in Mensh & Mensh, 1991) who developed a theoretical model known as *g* model (*g* as for general) (Sternberg & Grigorenko, 2002). Spearman believes that intelligence is an underlying mental ability, which is the basis of all our intellectual abilities. In his view, the “*g*” factor is a mental energy or brain power that makes people intelligent (Mensh & Mensh, 1991). Later on, the concept of intelligence was extended and attracted more scholars’ attention through work of Alfred Binet and his IQ test putting language and logic as the sole basics of intelligence (as cited in Valencia & Suzuki, 2001). Since then, IQ tests were misinterpreted with discriminating intentions and people with low IQ score were forbidden from social rights. Just to mention an example, IQ test was the determining factor for parents to have children in the US supported by eugenics movement advocates (Valencia & Suzuki, 2001).

Theory of multiple Intelligences revolutionizes the traditional and monolithic view of intelligence (Gardner, 1983). He asserts that the concept of intelligence has defined and limited in logic and language. Gardner (1999) also acknowledges that multiple intelligences theory, on the other hand, pluralizes the traditional concept. Unlike the previous model, Gardner (1999) puts the theory of intelligence in its social context by defining it as the ability to solve problems, or create the products that are valuable within one or more cultural settings. It is clear that the new view of intelligence is unbiased and cultural free. Gardner (1983) first introduces seven intelligences including linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, interpersonal, and intrapersonal. He further adds the naturalistic intelligence to this list (Gardner, 1999). All intelligences are independent of the others in different degrees. Also all people have these intelligences in varying degrees but each person has a unique profile because of values existing in a particular society, available opportunities in the culture to be gained and personal decisions affected by individuals, their families, and etc. The following are definitions of the intelligences according to Gardner (1999):

1. Verbal / Linguistic Intelligence: The ability to use language effectively both orally and in writing.
2. Logical/Mathematical Intelligence: The ability to use numbers effectively and reason well.
3. Visual/Spatial Intelligence: The ability to recognize form, space, color, line, and shape and to graphically represent visual and spatial ideas.
4. Bodily/Kinesthetic Intelligence: The ability to use the body to express ideas and feelings and to solve problems.
5. Musical Intelligence: The ability to recognize rhythm, pitch, and melody.
6. Interpersonal Intelligence: The ability to understand another person's feelings, motivations, and intentions and to respond effectively.
7. Intrapersonal Intelligence: The ability to know about and understand oneself and recognize one's similarities to and differences from others.
8. Naturalist Intelligence: The ability to recognize and classify plants, minerals, and animals.

Gardner (1999) considers not only the features of psychometric tests when studying human intelligences, but also he draws evidences from different disciplines like, evolutionary biology, anthropology, developmental and cognitive psychology, neuropsychology, and traditional psychological research (Gardner, 1999). He considers eight criteria in identifying intelligence. 1) the potential isolation by brain damage, 2) evolutionary history and evolutionary plausibility, 3) identifiable core operation or a set of operations, 4) susceptibility of encoding in a symbolic system, 5) a distinct developmental history, along with a set of definable set of expert, ‘end-state’ performances, 6) the existence of idiot savants, prodigies and other exceptional people, 7) support from experimental psychological tasks, and 8) support from the psychometric findings (Gardner, 1999).

There are also some relationships between multiple intelligences theory and learning process. According to Armstrong (2003), multiple intelligences theory helps schools to reform their educational curriculum and look at children as responsible and independent individuals. In this theory high level of attention is paid to children and their innate potentials rather than mastering superfluous academic knowledge (Gardner, 1999). Many public schools established their curriculum, in the field of education, based on multiple intelligences. Some schools, for example, in United States, The Sky school in Indianapolis and Cambridge Port school in MA (Gardner, 1983; Sinder, 2001) and also some schools in Brazil (Botelho, 2003) adopted multiple intelligences in their curriculum.

Some research studies are conducted in the field of language teaching to consider the importance of multiple intelligences. Strahan (1996) investigates the use of multiple intelligences theory in brain-based teaching and learning strategy and found an increase rate in the behavior of disengaged students. Furthermore, Greenhawk (1997), in an action research, find that students improve their proficiency in reading comprehension and vocabulary promoted when curriculum is designed and performed based on multiple intelligence theory. In a qualitative study, Green (1999) concludes that implementing the multiple intelligences theory, students can easily transfer learning skills and strategies from one subject to another and are more responsible with their learning experience. Chen (2007) also discovers that there is a significant difference in learning outcome between the experimental group for whom multiple intelligences theory is implemented in their teaching and the control group.

## **2.2. Importance of Textbooks and Multiple Intelligence Theory**

The importance of teaching textbooks has been also discussed by some researchers such as Sheldon (1988), Plamberg (2001) and Richards (2001). Sheldon (1988) asserts that textbooks are the most important part of every ELT (English Language Teaching) program. Textbooks provide content of the lessons for students and can provide teachers with teaching materials (Richards, 2001). Sometimes textbooks may have inadequate representation of cultural understanding or contextualization of language activities (Richards & Renandya, 2002). Textbooks, however, can provide a clear framework for students and teachers to follow the tasks and activities which are equate to language proficiency levels of students (Littlejohn, 1998). English as foreign language textbooks (EFL) have changed in accordance to students' learning needs. Accordingly Sinder (2001) realizes that textbooks represent an eclectic amalgam of different language teaching methods, approaches and techniques. Because of the importance of textbooks in language teaching, researchers in the field of material development and textbooks designing suggest that evaluation checklists should be implemented in selecting the right course books equating to students' proficiency level (Sheldon, 1988). One of the possible checklists is multiple intelligence (MI) checklists. In recent years, textbooks have been analyzed through MI checklists and Botelho (2003) highlights that the types of intelligences in analyzed textbooks were mainly verbal/linguistic. Locally-designed ELT textbooks in Turkey were studied by Kırkgöz (2010) and the result shows verbal/linguistic intelligence followed by visual/spatial type of intelligence were the most applied ones and naturalistic intelligence was the least applied one in EFL textbooks. Taase (2012) also analyzes locally-designed EFL textbooks in high schools in Iran and concludes that Iranian EFL textbooks lack distribution of intelligences.

## **2.3. The Present Study**

Having reviewed the related literature in MI and language teaching, the authors find that previous studies consider textbooks and students separately according to multiple intelligences theory. In the present study, both students and their textbooks are considered under MI theory to answer the following questions:

- 1) What type/s of intelligences is/are used dominantly in ELT textbooks?
- 2) What type/s of intelligences is/are preferred mostly by students?
- 3) Does level of textbooks have any significant effect on the intelligence types used in the textbooks?
- 4) Does level of students have any significant effect on their preferences for different types of intelligences?

## **2.4. Significance of the Study**

This research study is significant because students' needs, styles and potentials are considered bilaterally. In this study more attention is paid on individual intelligence preferences and a possible modification in ELT textbooks. We hope the results of this study will be useful for students, teachers, domestic curriculum developers, material developers and textbooks designers.

## **3. Method**

### **3.1. MI Checklist and MI inventory**

In this study we implement the checklist developed by Botelho (2003, see appendix 1). According to this checklist each of the eight intelligences is defined and related activities, materials and descriptions are listed. Logical mathematical intelligence, for example, is defined as the ability to use numbers effectively and reason well. Some related activities and techniques to enhance this intelligence are also listed such as: logic puzzles and games, Story problems with numbers, logical/sequential presentation of subject matter, logical argumentation, problem solving. Botelho (2003) studies and analyzes some reliable sources (such as Christison, 1996; Plamberg, 2001) to compile the relevant information about intelligences.

Taase and Mohebbi (2013) apply Botelho's checklist to assess the students' multiple intelligences and student-generated inventory for secondary level and young adult learners (Christison, 1996) with Cronbach's Alpha reliability 0.81. This inventory is divided into eight parts. Each part includes six items based on three scales: 0 denoting disagreement, 2 denoting a strong agreement and 1 somewhere in between. The Persian translated version of the questionnaire is distributed among participants.

### 3.2. Textbooks Analysis

Textbooks are analyzed carefully, using Botelho's checklist to identify the embedded intelligences in the exercises and activities. A very careful analysis for all the activities and exercises in four textbooks was employed to specify the need for types of intelligences. The textbooks are now taught in Kish Institute of Science and Technology in Iran. The four textbooks written by Derek Strange and Diane Hall (Strange & Hall, 2005) and used four teenage students include PACESETTER STARTER (the red book for beginners), PACESETTER1 (the blue book for elementary students), PACESETTER2 (the brown book for pre-intermediate students and PACESETTER3 (the green book for intermediate students). These ELT textbooks are published by Oxford University Press. Pacesetter series is designed for teenage students from beginner to intermediate level. These ELT series books follow a communicative and problem solving approach to teaching methodology by presenting contextualized language, motivating topics, integrated skills, and so forth.

The first step to identify the appropriate type of intelligence used in textbook activities is to find out what sort of intelligence each activity represents. In order to do this the given instruction to fulfill each activity is analyzed. For example, an activity such as: "Read the tourist information. What is Muir wood? Why is it famous?" was considered verbal/linguistic. Some of the activities were a combination of two or more intelligences. For example, "Look at these trees. Which one of them is 1.the tallest? 2. The thickest? 3. The smallest? 4. the most colorful? These are considered both visual/spatial and verbal/linguistic intelligence. Instruction of each activity, elements accompanied with each activity (like pictures) and the skills being practiced in each activity are taken into account. Intelligence frequency (number of occurrences in activities) is counted in each unit and then summed up for each textbook. At the end of each unit there is a part called, Review and Grammar and Practice parts, which are not considered in our study.

### 3.3. Participants and Procedures

The participants of this study are recruited from Kish language institute in Tehran, Iran and selected according to their and language proficiency level in which they study English at this institute. Participants were given the information sheet including some information about purpose of the study, advantages and possible limitations for them and their rights as participants. The participants' consent form was then given to participants who accepted the invitation to take a part in this study.

As mentioned above participants were selected from different level of proficiency; starter (80 students), elementary (90 students), pre-intermediate (90 students) and intermediate (95 students) and their age ranged from 11 to 17. Students were guided to fill out the questionnaire and answered their questions relating intelligence inventory.

To ensure the validity of the analysis, the textbooks were analyzed independently by the authors. They counted the types of intelligences in all four textbooks. The inter-rater reliability was 0.96. A conclusion was reached through discussion of the remaining percentage.

Each of the textbook was taught in five terms in Kish language institute. On the other hand, the participants were recruited from all the five terms from each textbook level (making the uniformity of subjects). In order to ensure consistency in the responses, the final scores of participants in each level were considered. Only the participants with the scores ranging from 70 to 100 were kept and the lower ones were deleted.

## 4. Results

### 4.1. Research question one: Frequency analysis

Table 1 shows the distribution of different types of multiple intelligences in the textbooks.

**Table 1: Frequency Distribution of Intelligences in Textbooks**

Textbooks level	Verbal-linguistics	Logical-mathematical	Visual-spatial	interpersonal	Intrapersonal	Bodily-kinesthetic	musical	natural	total
Pacesetter Starter	302 42.89	88 12.5	123 17.47	119 16.90	35 4.97	9 1.27	5 0.71	23 3.26	704 100%
Pacesetter1	328 41.5	104 13.16	96 12.15	108 13.67	68 8.60	10 1.26	1 0.012	27 3.41	790 100%
Pacesetter2	320 48.48	78 11.81	74 11.21	88 13.33	65 9.84	8 1.21	3 0.45	24 3.63	660 100%
Pacesetter3	332 45.29	99 13.50	100 13.64	98 13.36	77 10.50	2 0.27	5 0.68	19 2.59	733 100%

Table 1 illustrates the frequency occurrence of intelligences in textbooks. As shown above, verbal linguistic intelligence is the dominant type of intelligence with 48.48 to 41.5 activities in the textbooks. Also musical and bodily kinesthetic intelligences are the least frequently used types of intelligences. Only 1.27 to 0.27% of activities and exercises cater for the students who are bodily-kinesthetically oriented and in much lesser ratios between 0.71 to 0.012% of activities suit students who are musically oriented. In Pacesetter starter textbook, visual spatial intelligences (17.47) and interpersonal (16.90) are the next mostly used types of intelligences followed by logical mathematical (12.5). Intrapersonal (4.97), natural (3.26) and musical intelligence were used significantly in lesser ratios. Interpersonal (13.67) and logical mathematical (13.16) intelligences are the next frequently used types of intelligences in Pacesetter 1 followed by visual spatial (12.15) and interpersonal intelligences (8.6). Naturalistic (3.26), bodily kinesthetic and musical intelligences were found significantly in lower percentage. Interpersonal intelligence (13.33) was the second widely used type of intelligence in Pacesetter 2 textbook followed by logical mathematical (11.81). The fourth type was visual spatial (11.21) and the fifth prevalent type was intrapersonal (9.84). Like other textbooks, natural (3.63), bodily kinesthetic (1.21) and musical intelligences were the least incorporated types. Visual spatial (13.64), logical mathematical (13.50) and interpersonal (13.36) were the next three frequent categories of intelligences in Pacesetter 3 textbook followed by interpersonal type (10.50). The least kinds of intelligences were natural, bodily kinesthetic and musical ones.

### 4.2. Research Question two: Descriptive Statistics

To investigate the inclinations toward different categories of multiple intelligences, descriptive statistics was used to show the preferred types of intelligences by EFL students.

**Table 2: Descriptive Statistics of EFL students' Intelligences**

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
VERBALLINGUISTIC	346	2.00	12.00	7.6763	1.89564
MUSICAL	346	.00	12.00	6.2890	2.64142
LOGICALMATHEMATICAL	346	1.00	12.00	8.1676	2.11021
VISUALSPATIAL	346	1.00	112.00	7.3757	6.13263
BODILYKINESTHETIC	346	.00	12.00	7.3208	2.15850
INTRAPERSONAL	346	.00	12.00	6.5087	2.13628
INTERPERSONAL	346	1.00	12.00	8.2890	2.20612
NATURAL	346	.00	12.00	7.0983	2.63018
Valid N (listwise)	346				

As shown in table 2, EFL students preferred interpersonal intelligence with the mean of 8.28 predominantly followed by logical mathematical (8.16), verbal linguistic (7.67), visual spatial (7.37), bodily kinesthetic (7.32), natural (7.09), intrapersonal (6.50) and musical (6.28).

### 4.3. Research Question Three: Chi-Square Test

A Chi-Square test was run to probe any significant effect of textbooks' level on the application of multiple intelligences in their activities and exercises.

**Table 3: Chi-Square Test for English Textbooks' Proficiency Level and Multiple Intelligences**

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	44.183 <sup>a</sup>	21	.002
Likelihood Ratio	47.803	21	.001
Linear-by-Linear Association	.451	1	.502
N of Valid Cases	2838		

Chi-square analysis showed book levels having significant effect on the application of multiple intelligence  $\chi^2$  (21, N=2838) =44.183,  $p < .05$ . The cross-tabulation table (5) below shows that application of verbal linguistics category in intermediate book was (332, 45.4%) followed by elementary books (328, 44.2%) and pre intermediate (320, 48.5%) and finally book in starter levels (202, 42.9%). Highest application of LOGICALMATHEMATICAL category was in ELEMENTARY (104, 14.0%); intermediate (99, 13.5%); STARTER (88, 12.5) and pre intermediate (78, 11.8%) respectively. Visual spatial intelligence was used mostly in STARTER (123, 17.5); followed by ELEMENTARY (96, 12.9); INTERMEDIATE (100, 13.7) and PRE-INTERMEDIATE (74, 11.2). The highest prevalence of interpersonal category was in STARTER (119, 16.9) proceeded by ELEMENTARY (108, 14.6), INTERMEDIATE (98, 13.4) and PRE-INTERMEDIATE (88, 13.3). Intrapersonal intelligence was used most frequently in INTERMEDIATE (77, 10.5); ELEMENTARY (68, 9.2); PRE-INTERMEDIATE (65, 9.8) and STARTER (35, 5.0). The use of bodily-kinesthetic intelligence was the highest in ELEMENTARY (10, 1.3); STARTER (9, 1.3); PRE-INTERMEDIATE (8, 1.2) and INTERMEDIATE (2, .3%). Musical intelligence was predominantly applied in STARTER (5, .7%); INTERMEDIATE (.7%); PRE-INTERMEDIATE (3, .5%) and ELEMENTARY (1, .1%). Regarding natural intelligence, it was applied most abundantly in ELEMENTARY (27, 3.6%); PRE-INTERMEDIATE (24, 3.5); STARTER (23, 3.3) and INTERMEDIATE (19, 2.6).

**Table 4: English Textbooks Proficiency Level and Multiple Intelligences Cross-tabulation**

Textbookslevel \* Intelligences Cross tabulation

		Intelligences								Total
		Verbal Linguistic	Logical mathematical	Visual spatial	Inter Personal	Intra Personal	Bodily kinesthetic	Musical	Natural	
Starter	Count	302	88	123	119	35	9	5	23	704
	% Within Textbookslevel	42.9%	12.5%	17.5%	16.9%	5.0%	1.3%	.7%	3.3%	100.0%
Elementary	Count	328	104	96	108	68	10	1	27	742
	% Within Textbookslevel	44.2%	14.0%	12.9%	14.6%	9.2%	1.3%	.1%	3.6%	100.0%
Pre-Intermediate	Count	320	78	74	88	65	8	3	24	660
	% Within Textbookslevel	48.5%	11.8%	11.2%	13.3%	9.8%	1.2%	.5%	3.6%	100.0%
Intermediate	Count	332	99	100	98	77	2	5	19	732
	% Within Textbookslevel	45.4%	13.5%	13.7%	13.4%	10.5%	.3%	.7%	2.6%	100.0%
Total	Count	1282	369	393	413	245	29	14	93	2838
	% Within Textbookslevel	45.2%	13.0%	13.8%	14.6%	8.6%	1.0%	.5%	3.3%	100.0%

#### 4.4. Research Question Four: One-Way ANOVA

The result of one-way ANOVA to investigate the effect of students' language proficiency level on their multiple intelligences showed that students' proficiency level does not have any significant effect on their intelligences.  $F(4,361) = 1.95$ ,  $p = .102$ ,  $\omega^2 = 0.02$  (Table 5).

**Table 5: ANOVA Test for Students' Language Proficiency Level and Their Multiple Intelligences**

ANOVA					
Multiple intelligences	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1144.969	4	286.242	1.950	.102
Within Groups	50057.947	341	146.797		
Total	51202.916	345			

#### 5. Conclusion and Discussions

Multiple intelligences theory is about individual differences and revolutionized the traditional notion of intelligences circumscribed in language and logic. According to this theory, intelligences are a small set of human intellectual abilities that are possessed by all individuals in society (Gardner, 1983). This theory is considered in language teaching to improve students' capabilities in learning process. Christison (1996) postulates that students can create an idiosyncratic learning condition by considering the multiple intelligences theory in their second language education. ELT/ EFL textbooks have undergone significant modifications to cater for different needs and learning styles of students.

In the present study, the researchers considered the students and their textbooks from a multiple intelligences perspective. Also the effect of other variables such as English language proficiency level of students and their textbooks on MI was investigated. The results of this research study are aligned with some research studies (e.g. Taase, 2012; Taase & Mohebbi, 2013) and reveal that the students preferred all types of intelligences in varying approximate degrees however some of them were among students' preferences. The results of this part seem to challenge the principles of multiple intelligences about individuals. This principle says everybody has all eight areas of intelligence and people can improve their intelligence in varying extents. Accordingly, the researchers recommend EFL teachers to include and consider all types of intelligences in their unit outline and classroom activities.

In relation to students' level of English language proficiency and its effect on students' multiple intelligences, the results of the study indicated that the students' level of proficiency (starter, elementary, pre-intermediate and intermediate) does not have any significant effect on their multiple intelligences. Therefore EFL teachers and textbook designers need to consider all multiple intelligences and learning styles in developing learning materials. This might help EFL students to be responsible for their own learning by using their intelligences.

The frequency analysis of intelligences also shows that although musical, bodily-kinesthetic and natural categories are in low ratios, Pacesetter textbook series included other types of intelligences (verbal/ linguistics, logical/ mathematical, visual/ spatial, interpersonal and intrapersonal) in their content. Verbal/linguistic was found in dominant ratio, other types of intelligences such as visual spatial, interpersonal and intrapersonal intelligences were found in high percent. Another studies (e.g. Botelho, 2003; Kirkgoz, 2010; Taase, 2012) of students and multiple intelligences discovered that the verbal/ linguistic intelligence usually follows by some other types of intelligence like interpersonal, visual/ spatial, intrapersonal and logical/ mathematical. The researchers advocate that EFL teachers can modify the textbooks' activities and exercises to promote all types of intelligences in students.

The result of this study found no significant difference relating the effect of students' English language proficiency levels on their multiple intelligences. The effect of textbooks' proficiency levels (Pacesetter books series), however, is significant. The researchers recommend that in order to promote students' multiple intelligences exercises and activities, there is no need to consider students' language proficiency level. The types of intelligences in each exercise and activity, however, should equate students' intelligence preferences.

## 6. Suggestions for Further Study

Textbooks designed for adult EFL students can be studied in terms of multiple intelligences and compared with teenage students' EFL textbooks. Students' gender and its effect on multiple intelligences can also be investigated. The researchers advise the readers and researchers to further study EFL teachers' multiple intelligences and their attitudes toward EFL textbooks. Accordingly attitudes of EFL teachers' and students' toward EFL textbooks based on multiple intelligences can be also considered for further studies.

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## **Appendix**

List of activities, techniques, materials and descriptions of each intelligence.

### **Verbal/linguistic**

- 1.Note taking
2. Riddles
3. Worksheets
4. Listening to lectures
5. Word play games
6. Listening to talking books
- 7.Reading books
- 8.Discussions
- 9.Story telling
- 10.Journal keeping
- 11.Debates
- 12.Memorizing
- 13.Writing

The ability to use words effectively both orally and in writing. Remembering information, convincing others to help and talking about language.

### **Logical/mathematical**

- 1.Science demonstrations and experiments
- 2.Logic puzzles and games
- 3.Story problems with numbers
- 4.Logical/sequential presentation of subject matter
- 5.Logical argumentation
- 6.Problem solving

The ability to use numbers effectively and reason well. Ability to predict, understand basic properties of numbers and principles of cause and effect. Recognizing abstract patterns, creating codes.

### **Spatial/visual**

- 1.Illustrations
- 2.Graphs
- 3.Tables
- 4.Using charts and grids
- 5.Videos, slides and movies
- 6.Using arts
- 7.Maps
- 8.Photos
- 9.Using graphic organizers
- 10.Imaginative story telling
- 11.Painting/picture/collage
- 12.Mind maps
- 13.Telescope/microscope
- 14.Visual awareness activities
- 15.Students' drawings

### **Bodily/kinesthetic**

- 1.Hands-on activities
- 2.Field trips
- 3.Role plays
4. Creative movements
- 5.Mime

- 6.Body language
- 7.Classroom aerobics
- 8.Cooperative group rotation
- 9.Cooking and other “mess” activities

The ability to use the body to express ideas and feelings and to solve problems.

Skills: coordination, flexibility, speed and balance.

### **Musical**

- 1.Singing
- 2.Songs
- 3.Playing recorded music
- 4.Playing live music
5. Jazz chants
6. Music appreciation
7. Student made instruments
8. Background music

Sensitivity to rhythm, pitch and melody. Recognizing simple songs and being able to vary speed, tempo and rhythm in simple melodies.

### **Interpersonal**

- 1.Pair work
- 2.Peer teaching
- 3.Board games
- 4.Group brainstorming
- 5.Project work
- 6.Work cooperatively

The ability to understand another person’s moods, feeling, motivations and intentions. Skills: responding effectively to other people, problem solving and resolving conflict.

### **Intrapersonal**

- 1.Activities with a self-evaluation component
- 2.Interest centers
- 3.Options for homework.
- 4.Personal journal keeping
- 5.Checklist
- 6.Inventories
- 7.Individualized projects
- 8.Doing things by yourself

The ability to understand yourself, your strength, weaknesses, moods, desires and intentions. Skills: understanding how someone is similar to or different from others, reminding oneself to do something, knowing how to handle one’s feelings, knowing about oneself as a language learner.

### **Naturalistic**

The ability to recognize and classify plants, minerals and animals including rocks, glass and all variety of flora and fauna. Classifying and categorizing activities.