Dasarath Neupane
Dr. K.N. Modi University,
Rajasthan, India

Chandrakala Dawadi
Science Teacher, Behadababa
Secondary School, Kailali,
Nepal

Multiple intelligences among secondary level school students from Kailali, Nepal

Dasarath Neupane and Chandrakala Dawadi

Abstract
Teacher's intellectual abilities may act as a force multiplier in student's learning and understanding and lead to the subsequent progress of their academic voyage. Performance of the individual as a person, citizen, as worker and as a student largely depends upon the intelligence he/she possesses. An intelligent person has the ability to adjust himself to the changing circumstances with ease, efficiency and speed. This study aimed to identify the types of multiple intelligences among secondary level students from Kailali, Nepal in light of Gardner's theory. To achieve this aim, the Multiple Intelligences Test (MIT) was administered on a study sample consisting of (300) students from four (two public and two private) schools. The results of the study showed that the naturalistic intelligence ranked first, while the linguistic intelligence came last, and that there were statistically significant differences on the bodily-kinesthetic intelligence and spatial-visual intelligence, while there were not statistically significant differences on the rest of the intelligences attributed to the school types (public and private). The study concluded with suggesting many recommendations.

Keywords: Gardener's theory, multiple intelligences, private and public school

Introduction
To increase teachers' performance and student's academic outcomes, MI approach has been implemented in a number of course contents at primary level, elementary level and secondary level in developed countries (Gul & Reba, 2017) [6]. There is challenge in the education field regarding the variation of student progress. "No two individuals are alike in the universe. If any student wants to reach his or her goals or aims he or she has to meet many challenges like cognitive ability, efficient methods of learning, concentration, memory, intelligence, learning environment and the students' progress" (Anitha, Vannessa, & Sreelakshmi, 2013, p. 12) [1]. Children differ immensely in intelligence. Intelligence is a general cognitive problem-solving skill. It is a mental ability involved in reasoning, perceiving relationships, analogies and calculating. It helps individuals to face and solve the complicated problems and situations, in learning things and making adjustments with the environment (Shaikh, Khan, & Wakpainjan, 2016, p. 95). "Intelligence refers to capacity to learn with speed and accuracy, Capacity to solve problems and Capacity to adjust in the society" (Anitha, Vannessa, & Sreelakshmi, 2013, p. 12) [1]. There is challenge in the education field regarding the variation of student progress.

No two individuals are alike in the universe. If any student wants to reach his or her goals or aims he or she has to meet many challenges like cognitive ability, efficient methods of learning, concentration, memory, intelligence, learning environment and the students' progress. Children differ immensely in intelligence. For everyone, multiple intelligences are needed to reason, plan, problem solving, think abstractly, comprehend complex ideas, learn quickly and learn from experience. Intelligence is not merely book learning, a narrow academic skill. But it reflects a broader and deeper capability for comprehending our surroundings. This is the age for development carrier choosing, carrier success, personal wellbeing and leadership to improve student's achievement and success. Intelligence plays an important role in life and contributes to the personal, social development of an individual and harmonious development of the personality of an individual (Kandeel, 2016) [7]. Intellectual development implies progressive changes in the mental process which go on from birth to death.

Correspondence
Dasarath Neupane
Dr. K.N. Modi University,
Rajasthan, India

Intellectual development includes various aspects such as development of concepts, perception, language, memory, reasoning, thinking and imagination. Making use of these multiple intelligences can help us restructuring our class rooms into places where everyone have higher degree of success than ever imagined. It enables the learner to understand and to develop their unique way of understanding and this empowers that person with a great self-esteem and enthusiasm. This theory can help each of us build upon both our strong and weak intelligences to become more whole, happy and productive human being. Multiple intelligences are needed to reason, plan, problem solving, think abstractly, comprehend complex ideas, learn quickly and learn from experience. Intelligence is not merely book learning, a narrow academic skill. But it reflects a broader and deeper capability for comprehending our surroundings. Intelligence is perhaps, still single most effective predicator of school achievement. This is the age for development carrier choosing, carrier success, personal well-being and leadership to improve student's achievement and success.

According to Gardner (1999) [5] intelligence is the ability to solve problems; a biophysical 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 through which individuals are able to learn/teach new information. The theory of multiple intelligences was proposed by Howard Gardner in 1983 to more accurately define the concept of intelligence and to address the question whether methods which claim to measure intelligence are truly scientific. In his conception, a child who masters multiplication easily is not necessarily more intelligent overall than a child who struggles to do so. The second child may be stronger in another kind of intelligence and therefore, may best learn the given material through different approach, may excel in a field outside of Mathematics, may even be looking at the multiplication process at a fundamentally deeper level, which can result in a seeming slowness that hide a mathematical intelligence potentiality higher than that of a child who easily memorizes the multiplication process (Chan, 2005) [3].

According to Thomas Armstrong (2009, p. 179) [2] the following table lists the occupations categorized by primary intelligence.

Table 1: Occupations categorized by primary intelligence

SN	Intelligences	Occupations
1	Linguistic	Librarian, archivist, curator, speech pathologist, writer, radio or TV announcer, journalist, legal assistant, lawyer, secretary, typist, proofreader, English teacher
2	Logical-mathematical	Auditor, accountant, purchasing agent, underwriter, mathematician, scientist, statistician, actuary, computer analyst, economist, technician, bookkeeper, math or science teacher
3	Spatial	Engineer, surveyor, architect, urban planner, graphic artist, interior decorator, photographer, art teacher, inventor, cartographer, pilot, fine artist, sculptor
4	Bodily-kinesthetic	Physical therapist, recreational worker, dancer, actor, mechanic, carpenter, craftsperson, physical education teacher, factory worker, choreographer, professional athlete, jeweler
5	Musical	Disc jockey, musician, instrument maker, piano tuner, music therapist, instrument salesperson, songwriter, studio engineer, choral director, conductor, singer, music teacher, musical copyist
6	Interpersonal	Administrator, manager, school principal, personnel worker, arbitrator, sociologist, anthropologist, counselor, psychologist, nurse, public relations person, salesperson, travel agent, social director
7	Intrapersonal	Psychologist, clergyman, psychology teacher, therapist, counselor, theologian, entrepreneur
8	Naturalist	Forest ranger, zoologist, naturalist, marine biologist, veterinarian, beekeeper, farmer, nature guide, ecologist, horticulturist, vintner, entomologist, tree surgeon

(**Source:** (Armstrong, 2009)

The following table shows brief highlights of eight multiple intelligences and the ways of learning preferences.

Table 2: The Nature of multiple intelligences and the ways of learning preferences

SN	Learners who are highly	Think	Love
1	Verbal-linguistic	In words	Reading, writing, telling stories, playing word games
2	Logical-mathematic	By reasoning	Experimenting, questioning, figuring out logical puzzles, calculating
3	Visual-spatial	In images and pictures	Designing, drawing, visualizing, doodling
4	Bodily-kinesthetic	Through somatic sensation	Dancing, running, jumping, building, touching, gesturing
5	Musical	Via rhythms and melodies	Singing, whistling, humming, tapping feet and hands, listening
6	Interpersonal	By bouncing ideas of other People	Leading, organizing, relating, manipulating, mediating, Partying
7	Intrapersonal	In relation to their needs, feelings, and goals	Setting goals, meditating, dreaming, planning
8	Naturalist	Through nature and natural forms	Playing with pets, gardening, investigating nature, raising animals, caring for planet earth

(**Source:** (Emmiyati, Rasyid, Rahman, Arsyad, & Dirawan, 2014, p. 104)) [4].

The schools are responsible for providing proper learning environment to students. Every school has its own climate which is perceived by the students. The schools follow a specific syllabus prescribed by respective boards of

affiliations but the experiences provided by schools, resources made available to students are different (Razmjoo, 2008) [8]. Therefore, the learning also differs in degree. For example if the school focuses on the physical development of students and organize sports and other physical activities in the school then the students may get ample opportunity to develop physical abilities and skills or bodily kinaesthetic intelligence. The formal education system is very structured and divided into grades. Each grade is characterized by specific curricular, co-curricular activities which are based on the developmental stage of the concerned age group.

Objective and research questions: The study aimed to explore the types of multiple intelligences among secondary level students from Kailali district of Nepal in light of Gardner's theory. In particular, the study attempted to answer the following questions:

1. What are the types of multiple intelligences among secondary level students of Kailali district?
2. Are there statistically significant differences in multiple intelligences abilities among secondary level students of Kailali district attributed to the school types?

Limitations of the study: The results of this study could be interpreted and generalized in the light of the following limitations:

1. The sample of the study was restricted to secondary level students only from selected four (Behadababa Secondary School, Shiva Secondary School, Mayur English Boarding School and Stone Bridge School) schools of the academic year 2017/2018.
2. The results of the study are attributed to school types only.

Methodology
Procedure: Data collection is essentially an important part of the research process. For the present study the data were collected from girls and boys studying in Grade 9, 10, 11 and 12 with English and Nepali as a medium of instruction from 4 schools situated in Dhangadhi, Kailali. Prior appointment and permission was taken from the principals of different schools. The researcher explained the purpose and procedure to the respondents to obtain their responses on the rating scale. Students were also permitted to ask any clarification and their difficulties. For data collection no fixed time limit was given for completing the task. This research is a quantitative research. This research was conducted at public and private owned schools, Kailali.

Participants: The number of participants of the study was 300 Secondary Level School students from the study area. The details are given in the following table.

Table 3: Demographic information

		Age					
		14.00	15.00	16.00	17.00	18.00	Total
		Count	Count	Count	Count	Count	Count
Gender	Male	4	2	101	23	20	150
	Female	8	116	2	14	10	150
Grade	9.00	7	52	3	0	1	63
	10.00	5	66	94	9	0	174
	11.00	0	0	6	23	6	35
	12.00	0	0	0	5	23	28
	Total	12	118	103	37	30	300
School Type	Public	8	82	66	21	24	201
	Private	4	36	37	16	6	99
	Total	12	118	103	37	30	300
Ethnicity	Brahmin Chhetri	3	3	88	21	15	130
	Janajati	5	54	0	12	5	76
	Tharu	3	57	8	3	8	79
	Dalit	1	4	7	1	2	15
	Total	12	118	103	37	30	300

(**Source:** Field Survey 2017)

Out of 300 respondents, 150 were boys and 150 were girls. Similarly, from grade 9 there were 63 respondents, 174 from grade 10, 35 from grade 11 and 28 from grade 12. Respondents were from both public and private schools. Out of 300 respondents, 201 were from public and 99 from private schools. Further, Table 2 shows the data of respondents' ethnicity. Out of 300 respondents, Brahmin/Chhetri were 130, Janajati 76, Tharu 79 and Dalit 15. However, this research analyzed data with reference to gender differences.

Results and Discussion: The first research question was to explore patterns of multiple intelligences among secondary level students. To answer this question, the mean and standard deviation were calculated and arrange all patterns of multiple intelligences in general and according to the grade level in the following tables.

Table 4: Averages, standard deviation and arrange for patterns of multiple intelligences for all students

Patterns	N	Mean	Std. Deviation	Rank
Naturalistic Intelligence	300	17.9733	8.02417	1st
Interpersonal Intelligence	300	17.0967	3.08963	2nd
Musical Intelligence	300	16.7700	3.98959	3rd
Intrapersonal Intelligence	300	16.6200	2.80628	4th
Logical-Mathematical Intelligence	300	16.6000	3.47663	5th
Bodily-Kinaesthetic Intelligence	300	16.5700	2.87971	6th
Spatial-Visual Intelligence	300	16.4867	2.77528	7th
Linguistic Intelligence	300	16.1233	3.22741	8th

(**Source:** Field survey 2017)

Results in the Table 4 show that naturalistic intelligence has the highest mean score, i.e. 17.9733. It means that many of them love playing with pets, gardening, investigating nature, raising animals, caring for planet earth, etc. Interpersonal intelligence has the second highest mean score (17.0967). They love leading, organizing, relating, manipulating, mediating, partying, etc. Musical intelligence has the third rank with 16.77 mean score. They love singing, whistling, humming, tapping feet and hands, listening, etc. Intrapersonal intelligence has fourth rank with 16.62 mean score. Learners who are highly intrapersonal, they think in relation to their needs, feelings and goals, and they love setting goals, meditating, dreaming, planning, etc.

Similarly, logical-mathematical has fifth rank with 16.60 mean score. Learners who are highly logical mathematical, they think by reasoning, and they love experimenting, questioning, figuring out logical puzzles, calculating, etc. Bodily-kinesthetic intelligence has sixth rank with 16.57 mean score. Learners who are highly bodily-kinesthetic think through somatic sensation, and they love dancing, running, jumping, building, touching, gesturing, etc. Spatial-visual intelligence has seventh rank with 16.4867 mean score. Learners who are highly spatial-visual they think in images and pictures, and they love designing, drawing, visualizing, doodling, etc. Linguistic intelligence has the least mean score. Learners who are highly logical-linguistic, they think in words, and love reading, writing, telling stories, playing word games, etc.

The second research question was to test statistical significance of multiple intelligences with respect to school types. To test the significant level ANOVA test was done. The following table shows the results.

Table 5: ANOVA test of multiple intelligences with respect to school types

		Sum of Squares	df	Mean Square	F	Sig.
Linguistic Intelligence	Between Groups	.217	1	.217	.021	.886
	Within Groups	3114.220	298	10.450		
	Total	3114.437	299			
Logical-Mathematical Intelligence	Between Groups	.102	1	.102	.008	.927
	Within Groups	3613.898	298	12.127		
	Total	3614.000	299			
Musical Intelligence	Between Groups	1.901	1	1.901	.119	.730
	Within Groups	4757.229	298	15.964		
	Total	4759.130	299			
Bodily-Kinaesthetic Intelligence	Between Groups	35.361	1	35.361	4.311	.039
	Within Groups	2444.169	298	8.202		
	Total	2479.530	299			
Spatial-Visual Intelligence	Between Groups	39.490	1	39.490	5.199	.023
	Within Groups	2263.456	298	7.595		
	Total	2302.947	299			
Interpersonal Intelligence	Between Groups	29.949	1	29.949	3.160	.076
	Within Groups	2824.248	298	9.477		
	Total	2854.197	299			
Intrapersonal Intelligence	Between Groups	.029	1	.029	.004	.952
	Within Groups	2354.651	298	7.902		
	Total	2354.680	299			
Naturalistic Intelligence	Between Groups	35.668	1	35.668	.553	.458
	Within Groups	19216.119	298	64.484		
	Total	19251.787	299			

(**Source:** Field survey 2017)

Table 5 shows that there are significant differences of bodily-kinesthetic intelligence and spatial-visual intelligence with respect to school types; p values (.039 & 0.023 respectively) are less than 0.05. However, there are no significant differences of linguistic intelligence, logical-mathematical, musical intelligence, interpersonal intelligence, intrapersonal intelligence and naturalistic intelligence of students of public and private school students; p values (.886, .927, .730, .076, .952 & .458 respectively) are greater than 0.05.

Conclusion and Recommendation: The purpose of this research was to explore and analyze multiple intelligences among secondary school students from Kailali, Nepal. The research shows that naturalistic intelligence has first rank and linguistic intelligence has eighth rank among eight multiple intelligences of the students from Dhangadhi Kailali. The data also show that there are significant differences of bodily-kinesthetic intelligence and spatial-visual intelligence with respect to school types. However, there are no significant differences of linguistic intelligence, logical-mathematical, musical intelligence, interpersonal intelligence, intrapersonal intelligence and naturalistic intelligence of students of public and private school students. This is not the final result because it does not cover all the students of Kailali district. These results show only the representative data. Thus, the following are the areas in which further studies can be conducted. A study of junior students' multiple intelligences in relation to gender, a study of students' multiple intelligences in relation to achievement motivation and parent-child relationship, a study of the relationship between multiple intelligences, home environment and academic achievement of school students, a comparative study of students' multiple intelligences in relation to their parental qualification and socio economic status etc.

References
1. Anitha T, Vannessa J, Sreelakshmi G. A study on the multiple intelligence levels of Secondary school

students of Government and Private schools in Secunderabad. IOSR Journal of Research & Method in Education (IOSR-JRME). 2013; 3(4):12-18.

2. Armstrong T. Other Application of MI Theory. In T Armstrong, Multiple Intelligences in the Classroom Virginia USA: ASCD. 2009, 173-181.

3. Chan DW. Perceived Multiple Intelligences and Learning Preferences among Chinese Gifted Students in Hong Kong. Journal for the Education of the Gifted. 2005; 29(2):187-212.

4. Emmiyati N, Rasyid MA, Rahman MA, Arsyad A, Dirawan GD. Multiple Intelligences Profiles of Junior Secondary School Students in Indonesia. International Education Studies. 2014; 7(11):103-110. doi:10.5539/iesv7n11p103

5. Gardner H. The disciplined mind: Beyond facts and standardized tests, the K-12 education that every child deserves. New York: Simon and Schuster. 1999.

6. Gul R, Reba A. A Study of Multiple Intelligence and Social Profiles of Secondary School Teachers, Peshawar. Journal of Applied Environmental and Biological Sciences. 2017; 7(6):226-235.

7. Kandeel RA. Multiple Intelligences Patterns among Students at King Saud University and Its Relationship with Mathematics' Achievement. Journal of Education and Learning. 2016; 5(3):94-106. doi:10.5539/jel.v5n3p94

8. Razmjoo SA. On the Relationship between Multiple Intelligences and Language Proficiency. The Reading Matrix. 2008; 8(2):155-174.

9. Shaikh N, Khan SM, Wakpainjan P. A Comparative Study of Multiple Intelligences of Students with Respect to Grades. The International Journal of Indian Psychology. 2016; 4(1):95-107. Retrieved from http://www.ijip.in