THE JOURNAL OF TEACHING ENGLISH FOR SPECIFIC AND ACADEMIC PURPOSES
Vol. 2, N° 4, 2014, pp. 591–602

UDC 811.111'276.4:61(520)

SELF–EVALUATION OF LEARNER'S MULTIPLE INTELLIGENCES IN AN UNDERGRADUATE ESP PROGRAM FOR NURSES AT A JAPANESE UNIVERSITY

Darlene Yamauchi

Niigata University of Health and Welfare, Japan
E-Mail: daryama2014@outlook.com

Abstract. *Learning success in English for Specific Purposes (ESP) courses have been associated with utilizing a learner-centered approach, therefore, prior to implementing teaching methods and techniques within an ESP curriculum, it may be considered beneficial to investigate learners' individual needs as well as their preferred learning styles, and learning strategies (Oxford, 2006). Research conducted by Gardner (1993) suggests that each person has the possibility of possessing different types of intelligences termed Multiple Intelligences (MI) namely: linguistic intelligence, logical-mathematical intelligence, visual-spatial intelligence, bodily-kinesthetic intelligence, musical intelligence, interpersonal intelligence, intrapersonal and most closely associated with language acquisition, other intelligences may be significant for language learning, particularly in ESP contexts, which embrace materials, pedagogies, and assessment from the content studies (Cameron, 2001, Lucietto, 2008).*
The following research discussed preliminary results from an intrinsic case study (Stake, 1995) applying MI principles to a first year university ESP course for nursing students. Quantitative data obtained from a Multiple Intelligences (MI) Inventory designed by the researcher and administered to students indicated that interpersonal and intrapersonal intelligences, not typically linked to language acquisition, were more prevalent than the standard linguistic intelligence with this group. Results suggested that utilizing MI principles might be beneficial in the ESP classroom for the development of more appropriate, student-centered teaching techniques.Thereafter, activities and techniques were modified to appeal to kinesthetic, musical, interpersonal and other intelligences within the current syllabus. This study and its practical implications for further research may have relevance for educators as well as students involved in the ESP area and those who are looking for more appropriate ways to assess student performance/behaviors may also find resonance.

Key words: *Multiple intelligences (MI), Japanese university, MI Inventory, English for Specific Purposes (ESP), nursing students*

1. INTRODUCTION

This study discusses preliminary results from an intrinsic case study (Stake, 1995) applying MI principles to a compulsory first year Japanese university ESP oriented course for nursing students. Literature review in the fields of MI, as well ESP will be discussed with a concentration on the unique needs of this student group. Quantitative data obtained from a Multiple Intelligences (MI) Inventory designed by the researcher and administered to students will be presented and/with results reported indicating that

interpersonal and intrapersonal intelligences, not typically linked to language acquisition, were more prevalent than the standard linguistic intelligence with this group will be outlined. Based on the results reported a discussion of the benefits of applying MI principles in the ESP classroom to aid in the development of more appropriate, student-centered teaching techniques will be presented to illustrate how activities and techniques might be modified to appeal to kinesthetic, musical, interpersonal and other intelligences within the current syllabus will be discussed, followed by conclusions and implications for further research.

2. LITERATURE REVIEW: INTELLIGENCE AND MULTIPLE INTELLIGENCES

English psychologist Charles Spearman (1904) published a paper on general intelligence in which he claimed that all forms of intellectual activity appear to originate from a unitary or general ability termed 'g factor' for problem solving. During this period the first intelligence (IQ) test was developed by the French psychologist Alfred Binet. Initially, it was a 30-item intelligence test aimed at identifying elementary school students in need of special education. Binet's research received interest in the United States with Lewis Terman from Stanford University publishing an amended version in 1916 of Binet's original test labeling it the Stanford-Binet Scale.

Although Binet had developed his scale with the goal of predicting children's school performance and not as a measure of intelligence across all endeavors, the results of his and Terman's work were viewed as confirmation of Spearman's groundbreaking theory, which became the prevailing view of intelligence throughout the 20th century. Although there were a few opponents to the concept of general intelligence commenting that the IQ test was a limiting instrument (Thorndike, 1927 and Thurstone, 1938). It was not until 1983 when the psychologist Dr. Howard Gardner presented an alternative hypothesis of intelligence, with his Theory of multiple intelligences challenging the traditionally held view of intelligence as an easily measured solitary isolated concept (Gardner 1983).

In terms of ESL learning empirical research (Gardner 2006, Skehan, 1998) there does not appear to be a strong correlation between IQ and second language learning. Therefore traditional IQ theories such as Spearman's appear may not be an accurate indicator of successful language learning, suggesting that other theories such as MI theory should also be considered.

2.1. Multiple intelligences

Dr. Howard Gardner's multiple intelligences (MI) theory (1983), although originally proposed as a psychological theory, has gained increasing popularity with educators particularly within the English as a Second Language (ESL) field as its learner-based philosophy provides an insight into the predominant emerging trend toward the realization of student individuality and the necessity of expanding instruction to respond to their unique needs (Richards &Rodgers, 2001). MI theory maintains that the traditional notion of intelligence as a fixed construct based on IQ testing offering a single static number is far too restrictive. His theory defines intelligence as "the capacity to solve problems or to fashion products that are valued in one or more cultural setting", implying that it has applications across cultures and that it values cultural differences (Gardner & Hatch, 1989). The MI theory proposes that intelligence is multi dimensional with at least

eight different intelligences, namely: mathematical-logical intelligence, verbal-linguistic intelligence, musical-rhythmic intelligence, bodily-kinaesthetic intelligence, interpersonal intelligence, intrapersonal intelligence, visual-spatial intelligence, and naturalist intelligence (Gardner, 1999). These intelligences with unique characteristics (see table 1) are viewed as constantly evolving and malleable, accounting for a broader range of human potential and diversity. Although some intelligences will be viewed as more prevalent than others, every individual possesses each of these intelligences to some degree, hence fundamentally each intelligence is considered equal (Armstrong, 2009). MI theory advocates for an educational environment that allows for greater learning opportunities to utilize students' stronger talents and allow advancement of less developed abilities in order to successfully understand the necessary information (Gardner, 1999).

Table 1 Multiple Intelligences

Verbal-linguistic intelligence: Well-developed verbal skills and sensitivity to the sounds, meanings and rhythms of words.
Mathematical-logical intelligence: Ability to think conceptually and abstractly and capacity to discern logical or numerical patterns.
Musical intelligence: Ability to produce and appreciate rhythm, pitch and timbre.
Visual-spatial intelligence: Capacity to think in images and pictures and to visualize accurately and abstractly.
Bodily-kinesthetic intelligence: Ability to control one's body movements and to handle objects skillfully.
Interpersonal intelligence: Capacity to detect and respond appropriately to the moods, motivations and desires of others.
Intrapersonal intelligence: Capacity to be self-aware and in tune with inner feelings, values, beliefs and thinking processes.
Naturalist intelligence: Ability to recognize and categorize plants, animals and other objects in nature.

2.2. Multiple intelligences and language learning

It is essential that learner individuality be addressed with respect to instruction including language instruction as, conventionally, teaching methods have appeared to work toward education for the so-called masses with similar methods being utilized for all students (Armstrong. 2009). Given that all learners are unique in their strengths it would seem counter-productive for teaching to proceed in a manner that all learners are identical. In recent decades the unique characteristics of MI have come to the forefront with a bulk of language learning research demonstrating that MI theory with its comprehensive methodology may be considered a valuable tool to in the language classroom (Reid, 1999).

MI theory asserts that in addition to learner individuality the holistic nature of learners should also be addressed in order for individuals to develop not only cognitively, but in other ways such as physically, artistically or even musically, to improve on traditional educational methods which as Rogers (1975:40) comments: "… have focused so intently on the cognitive and have limited themselves so completely to 'educating from the neck up' that this narrowness is resulting in serious consequences".

With regard to physical activity a view toward to Neuroscience, the neurophysiologist Hannaford (1995) offers a strong argument for the use of physical activity in the ESL classroom commenting that such activity brings a larger supply of oxygen to the brain which is intrinsic to the development of 'nerve cell networks' that are the basis of learning. Additionally, the neurobiologist Schumann (1994, 1997), researching a brain-based model of language acquisition comments that although cognition and emotion areas in the brain may be distinct and separate, these regions are indivisible; hence from a neural standpoint, affect is a vital part of cognition, offering further evidence for taking a more rounded approach in the classroom. Investigation of learning from a neuroscience perspective offers the explanation that the human brain is lined with neurons that interact with knowledge or learning resulting as the neurons join together to form synapses creating connections to reinforce these neural networks.

MI theory addresses the totality of learning, maintaining intelligence is not purely biologically determined or unchanging over time as viewed in traditional IQ testing but that intelligence(s) are trainable as well as changeable with proper instruction (Armstrong, 2009). With this knowledge it would appear that MI theory would be a more applicable construct than traditional views of intelligence.

2.3. ESP and nursing

An ESP curriculum is generally viewed with certain stages which must be followed in developing curricula, such as analyzing learners' needs, designing authentic materials, finding relevant and appropriate discourse, deciding on language activities and tasks, re-editing the design, and finally piloting and evaluating the materials (Litwack 1979). The success of language acquisition for professional purposes may be achieved if, language presented is perceived as meaningful and the instruction includes learning through practice, reflection, conversation, collaboration, as well as commitment (Leggo, 2004). In this manner ESP courses may be distinguished from English for General Purpose (EGP) courses as ESP courses focus more on the specific and immediate needs of the learners, and EGP courses may not focus on specific needs of the learners as learners at that stage may not be able to specify their contexts of using language (Swales, 1985).

In today's context, teaching ESP is oriented towards mastering skills for professional communication, which will further enable learners to become accepted members of the target environment. It follows that learners of English should try to emulate ways of communication held by those who are already members of the target communities (Basturkmen, 2006). In the current global environment the importance of English cannot be overlooked, particularly in the medical profession as ESP may be considered of great value in the professional training and as often nurses are considered the first gateway to the healthcare system for patients. The ability to communicate effectively in English for this occupation would be considered instrumental (Gylys and Wedding, 1983, Molhim, 2011).

2.4. Research question

Which students enrolled in a first year university ESP nursing class perceive multiple intelligences prevalent?

2.5. Methodology - setting and participants

This study was conducted in a medium sized private university specializing in health professions in Northern Japan. The participants (n=25) were a first year class of nursing students (22 female, 3 male) enrolled in an ESP class. The students were given a placement test upon entrance to the university and classes were formed based on the results therefore the students may be considered at approximately the same English language level. The class used for this preliminary study was comprised of the lowest scoring group of students and was chosen, as it was the researcher's class and offered the most convenient access. The MI inventories were all completed voluntarily with all participants consented in writing prior to the start of this study.

2.6. The instrument and procedures

The instrument utilized was an MI inventory designed by the researcher. The MI inventory contained 5 questions for pertaining to each intelligence with a total of 40 questions. The questions were presented randomly with a six-point likert scale devised as follows: 1 = strongly disagree, 2 = fairly disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = fairly agree, and 6 = strongly agree. It was hoped that using 6 points as opposed to the usual 5-point scale students would consider their choices more carefully (Babbie, 2005). The MI inventory was first designed in English (Figure 1) and then translated into Japanese (Figure 2).

Both Inventories were available to the students, but all students chose to complete the Japanese version. The inventories were administered in April at the beginning of the school year. In an effort to prevent anxiety or stress, as well as to promote candid responses, the students were reminded that the inventory was not an aptitude test and that their answers would be completely anonymous (Armstrong, 2009). There was no time limit for completion of the inventory, yet all inventories were completed within 15 minutes.

Rate the following statements from 1-6 as indicated as below.

Table 2

1 →	strongly disagree	4 →	somewhat agree
2 →	fairly disagree	5 →	fairly agree
3 →	somewhat disagree	6 →	strongly agree

Table 3

	Questions	Answer
1.	I like making things with my hands and enjoy activities such as building models, making origami, cooking or sewing.	
2.	Music is very important and without it something would be missing in my life.	
3.	At amusement parks my favorite place is roller coasters or similar attractions.	
4.	I have a good sense of direction and I can generally find my way around new places.	
5.	I keep a diary or journal and write in it at least once a week.	
6.	I like animals and they seem to like me.	
7.	I like outdoor activities like camping, hiking, and/or other outdoor sports.	
8.	I often see clear visual images when I close my eyes.	
9.	I like plants and am a good gardener.	
10.	I believe almost everything can be explained logically.	
11.	I play a musical instrument.	
12.	I can easily compute numbers in my head.	
13.	I like singing.	
14.	I enjoy reading books.	
15.	When I speak to people I talk about things that I have heard or read.	
16.	I consider myself independent or strong willed.	
17.	When I want to remember something I often use cameras to record what I see around me.	
18.	I have a strong awareness of my strengths and weaknesses.	
19.	I find it difficult to sit still for long periods of time.	
20.	I would rather go to a party with my friends than stay home alone.	

Table 4

	Questions	Answer
1.	I enjoy playing games that require logical thinking such as crossword puzzles, Sudoku, Othello, go, chess.	
2.	I prefer to ask someone for advice or help when I have a problem, rather than solve it by myself.	
3.	When I talk or try to explain something I often use hand gestures or other forms of body language.	
4.	I have at least three close friends.	
5.	I enjoy doing jigsaw puzzles, mazes, and other visual puzzles.	
6.	I frequently listen to music on the radio, cds, and iPod or on my computer.	
7.	I have thought often about my goals and dreams for the future.	
8.	I enjoy team sports, for example softball or volleyball, more than solo sports, group sports like swimming and jogging.	
9.	Japanese, social studies, and history are easier subjects for me than math and science.	
10.	Without realizing it I sometimes find myself humming or singing with a television commercial or a popular song.	
11.	My friends and family seem to ask for my advice.	
12.	I understand more from listening to the radio or a CD than I do from watching television or films.	
13.	I like to draw or sketch.	
14.	I recycle and separate garbage thoroughly at home or at school.	
15.	Math and/or science are among my favorite subjects.	
16.	I like sports and regularly participate in at least one sport or physical activity.	
17.	When I am driving, I pay more attention to the words written on billboards than to the scenery.	
18.	I enjoy watching movies or TV programs starring animals.	
19.	I'm interested in new advances or changes in science.	
20.	If I had a choice I would rather spend my free time alone than with lots of people.	

Page 2

MI インベントリー

それぞれの項目について、自分に当てはまるものを、下の１－６の中から選び、「回答」欄に、
その数字を記入してください。

Fig. 1 MI Inventory (English Version)

Table 5

1→	まったくあてはまらない	4→	どちらかといえばあてはまる
2→	ほとんどあてはまらない	5→	かなりあてはまる
3→	どちらかといえばあてはまらない	6→	ぴったりあてはまる

Table 6

	質問	回答
1.	プラモデルの組み立て、折り紙、料理、手芸など、手を使ってものを作ることが好きです。	
2.	自分にとって音楽はとても大切で、人生に欠かせないものです。	
3.	遊園地では、ジェットコースターのような乗りものが好きです。	
4.	方向感覚はいいので、初めての場所でも道に迷うことはありません。	
5.	少なくとも週に1回以上、日記のようなものを書いています。	
6.	動物が好きだし、動物にも好かれる方だと思います。	
7.	キャンプやハイキング、野外スポーツなど、アウトドアの活動が好きです。	
8.	目をつむっていても、はっきりと目で見ているような映像を思い浮かべることができます。	
9.	植物が好きで、ガーデニングが得意です。	
10.	ほとんどすべてのことは、論理的に説明できるものだと思います。	
11.	楽器を演奏します。	
12.	暗算が得意です。	
13.	歌うことが好きです。	
14.	本を読むことが好きです。	
15.	人と話をする時には、自分が読んだり聞いたりしたことについて話します。	
16.	自分は、意思をしっかり持った、自立した人間だと思います。	
17.	自分が見たことを覚えておくために、よくカメラを使います。	
18.	自分の長所や短所をよく知っています。	
19.	長い時間じっと座っていることが苦手です。	
20.	一人で家にいるより、友達と遊びに行くほうが好きです。	

Table 7

	質問	回答
1.	クロスワードや数独、オセロ、囲碁、将棋のような、論理的な思考を求められるゲームが好きです。	
2.	悩みがある時は、自分で解決するよりも、誰かにアドバイスや助けを求めたいです。	
3.	話しをする時や何かを説明しようとする時に、よく身振り手振りを使います。	
4.	少なくとも3人の親友がいます。	
5.	ジグソーパズルや迷路など、視覚的なパズルが好きです。	
6.	ラジオやCD、iPodでよく音楽を聞きます。	
7.	自分の将来の夢や目標についてよく考えます。	
8.	野球やバレーボールなどの団体競技の方が、水泳やジョギングなどの個人競技よりも好きです。	
9.	自分にとっては、国語や社会、歴史の方が、数学や科学より簡単に感じられます。	
10.	ふと気が付くと、無意識にCMソングや流行りの歌を口ずさんでいることがあります。	
11.	友達や家族などから、相談されることがよくあります。	
12.	ラジオなどで音声を聞く方が、テレビなどで映像を見るよりも、内容が理解しやすいです。	
13.	スケッチなど、絵を描くことが好きです。	
14.	家でも学校でも、ごみの分別はちゃんとします。	
15.	数学や理科は好きな科目です。	
16.	体を動かすことが好きで、すくなくとも１つは定期的に行っているスポーツがあります。	
17.	ドライブしている時には、景色より看板の文字に目がいきます。	
18.	動物に関する映画やテレビを見るのが好きです。	
19.	科学の進歩や変化に興味があります。	
20.	休みのときには、たくさんの人と一緒にいるよりも、一人でいる方が好きです。	

Page 2

Fig. 2 MI Inventory (Japanese Version)

2.7. Preliminary results and discussion

Looking at class averages solely (see Table 1), of all the intelligences, musical intelligence appeared to be perceived as the most prevalent by the students with 63.3%, followed by Interpersonal at 60%. The least prevalent intelligences perceived by this sample were linguistic intelligence with 43% and Logical-mathematical intelligence at 40%. Interestingly enough, linguistic and logical-mathematical intelligences, the two intelligences most strongly associated with language learning intelligences proved to be

the least prevalent in this sample (Gardner, 2006). Conversely, intelligences not typically associated with language learning, specifically naturalist and Intrapersonal, appeared to score higher than the typical language acquisition intelligences. Standard deviation was applied in an effort to increase the internal reliability of the data (Table 3), as reliability is often cited as a problematic issue with measuring MI (Klein, 1997).

With this knowledge it would seem that the traditional methods, such as grammar-translation method that are used extensively in Japanese classrooms need to be reevaluated in order to create a communicative teaching atmosphere that will be more conducive to promoting students' learning as well as MI potential (Onada, 2014).

Table 8 Class average of each intelligence

	Intelligence	Average score	Average Percentage
A	Linguistic	13/30	43.0%
B	Logical-Mathematical	12/30	40.0%
C	Spatial	14/30	46.7%
D	Bodily-Kinesthetic	17/30	56.7%
E	Musical	19/30	63.3%
F	Interpersonal	18/30	60.0%
G	Intrapersonal	15/30	50.0%
H	Naturalist	16/30	53.3%

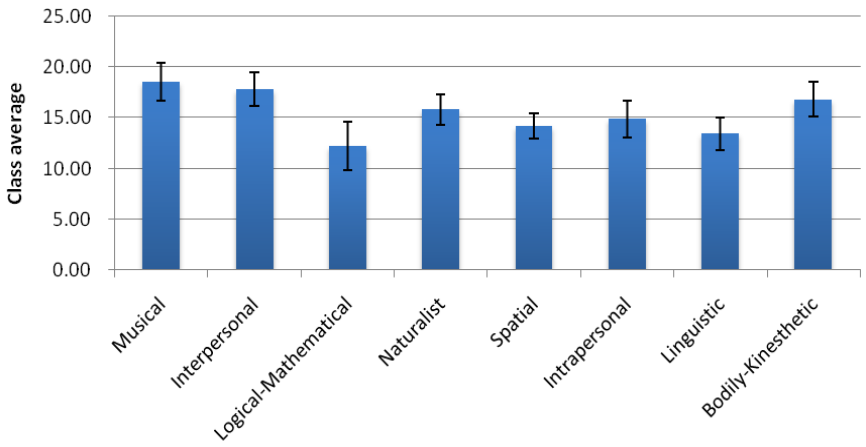

Fig. 1 Class average of scores with standard deviation

3. Conclusions and Hints for the Future

In this preliminary study, there was measured the perceived MI of the first year university ESP course for Japanese nursing students. The results from the MI inventory demonstrated that with this group, linguistic and logical-mathematical intelligences were the least prevalent. From this pilot research, it can be inferred that utilizing MI principles may be beneficial in the ESP classroom for the development of more appropriate,

student-centered teaching techniques. In future studies it would be of great value to look at the specific methods and techniques catering to students' MI that may be employed to improve the existing syllabi with the expectation of achieving an increase in language acquisition, as well as learning motivation. Although this study may be considered valid, one serious drawback of this research that cannot be overlooked is the reliability of the results obtained. Looking toward future studies, increasing the sample size from one class to all of the first year nursing classes may be beneficial in increasing the reliability of the results.

REFERENCES

Armstrong, T. (2009). *Multiple intelligences in the classroom 3rd edition*. Alexandria: ASCD.

Babbie, Earl R. (2005). *The Basics of Social Research*. Belmont, CA: Thomson Wadsworth.

Basturkmen, H. (2006). *Ideas and options in English for specific purposes*. Mahwah, New Jersey: Lawrence Erlbaum Associates.

Cameron, L. (2001) *Teaching Language to Young Learners*. Cambridge: Cambridge University Press.

Christison, M. A. (2005). *Multiple Intelligences and Language Learning*. *A Guidebook of Theory, Activities, Inventories, and Resources*. San Francisco: Alta Books.

Gardner, H. (1999). *Intelligence Reframed. Multiple Intelligences for the 21st Century*. New York: Basic Books.

Gardner, H., & Hatch, T. (1989). *Multiple intelligences go to school: Educational implications of the theory of multiple intelligences.* Educational Researcher, 18(8), 4-9.

Gardner's theory. *Canadian Journal of Education*, 22, 377-394.

Gylys, B. A., & Wedding, M. E. (1983). *Medical terminology*. New York: F.A. Davis Co.

Hannaford, C. (1995). *Smart moves*. Alexander, NC: Great Ocean.

Klein, P. D. (1997). Multiplying the problems of intelligence by eight: A critique of

Leggo, C. (2004). The curriculum of becoming human: a rumination. *International Journal of Whole Schooling* 1 (1), 28-36.

Litwack, D. M. (1979). Procedure: The key to developing an ESP curriculum. *TESOL Quarterly*. 13, 383-391.

Lucietto, S. (2008). A Model for Quality CLIL Provision. *International CLIL Research Journal*, 1(1), 83-92. Retrieved 17.7.2014 from: http:/www.icrj.eu/index?vol=11 &page=746

Molhim, M. A. (2011). English for medical purposes course design for Arab university students. *English for Specific Purposes World* 32, 1-21.

Onoda,S. (2014). An exploration of effective teaching approaches for enhancing the oral fluency of EFL students. In Muller, J. Adamson, P. Brown & S. Herder (EDS.) Exploring EFL Fluency in Asia.(p.120-142), New York: PalgraveMacmillan.

Oxford, R. (2006).Task-Based Language Teaching and Learning: An Overview. *Asian-efl journal*, 9 (29), 56-69.

Reid, J. (Ed). (1998). *Understanding learning styles in the second language classroom*. Upper Saddle River, NJ:Prentice Hall Regents.

Richards, J. C. & Rodgers, T. S. (2001). *Approaches and methods in language teaching* (2nd ed.). Cambridge, UK: Cambridge University Press.

Rogers, C. (1975). Bringing together ideas and feelings in learning. In D. Read & S. Simon (Eds.) *Humanisticeducation sourcebook* (pp.40-41). Englewood Cliffs, NJ: Prentice Hall.

Schumann, J. (1994). Where is cognition? *Studies in Second Language Acquisition* 16, 231-42.

Schumann, J. (1997). *The neurobiology of affect in language*. Boston: Blackwell.

Skehan, P. (1998). *A Cognitive Approach to Language Learning*. Oxford: O.U.P.

SPEARMAN, C (1904) General Intelligence, Objectively Determined and Measured. *American Journal of Psychology* 15, 201-293.

Stake, R. (1995). *The art of case research*. Thousand Oaks, CA: Sage.

Swales, J. (1985). *Episodes in ESP*. Oxford: Pergamon.

Thorndike, R.L. (1936). Factor analysis of social and abstract intelligence. *Journal of Educational Psychology*, 27, 231-233.

Thurstone, L. (1938). *Primary Mental Abilities*. Psychomatic Monographs, No. 1. Univ. of Chicago Press.