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Development of a Self-Rating Multiple Intelligences Computerized Assessment System for Intellectual Development and Student Counseling

Kwok-cheung Cheung
Faculty of Education
University of Macau

BRIDGES is a computerized assessment system run on the Microsoft windows Excel environment that validates self-rating multiple intelligences data. This paper reports a case study of senior secondary students at grade 12 level (N = 199) in an established school in Macao to illustrate the characteristics and functions of BRIDGES. The system is based on Gardner's theory of multiple intelligences and is a tool to experiment ideas of individually configured education. The school in this research study finds the assessment system very practicable and user-friendly. Using BRIDGES, teachers are able to issue multiple intelligences spectrum to students and provide them with programs for intellectual development and services for student counseling.

Key words: multiple intelligences; computerized assessment system; individually configured education

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Correspondence concerning this article should be directed to Kwok-cheung Cheung, Faculty of Education, University of Macau, Caixa 3001, Taipa, Macao. E-mail: kccheung@umac.mo

Purpose of Study

Application of the theory of multiple intelligences (MI) for individually configured education is a hot research topic in both western and Chinese speaking communities (Armstrong, 1987, 1994; Campbell, Campbell, & Dickinson, 1992; Cheung, 2004a; Gardner, 1983, 1985, 1991, 1993, 1999; Hoerr, 2000; Lazear, 1999a, 1999b, 1999c). At the secondary education level, good examination results are often considered as most important for secondary graduation and university entrance. It is a common observation in Macao, and in some other Chinese communities, that bright students are encouraged by their form teachers to study in the science stream. On the contrary, students with inferior academic results are often allocated for study in the arts stream. When advising students, school counselors rarely place high priority on the intellectual profiles of the students. One reason is that teachers lack time and opportunities to evaluate students' manifestation of emerging potentials. Their foci are mainly on urging students to secure good marks in high-stake examinations.

It is therefore important for schools to change this scenario by empowering teachers to educate or counsel students based on the full spectrum of intellectual potentials of the students. In order to do this, a computerized assessment system that is scientific, practicable, and user-friendly is fervently needed for schools to practice individually configured education. Based on the theory of multiple intelligences, one feasibility study has been conducted in the past few years (see Cheung, Tang, & Lam, 2003, for details). Based on the results of this study, a computerized assessment system entitled BRIDGES (Brain-based Recommendations for Intellectual Development and Good Education — A self-rating system) has been constructed. The primary function of BRIDGES is validation of self-rating multiple intelligences data and production of assessment reports for purposes of intellectual development and student counseling (see Appendix A for a sample of multiple intelligences spectrum and Appendix B for a copy of the musical intelligence response pattern report; there are similar reports for the linguistic,

logical-mathematical, spatial, bodily-kinesthetic, interpersonal, intrapersonal, and naturalist intelligences).

Design Requirements and Features of BRIDGES

To facilitate setting up of the school-based computerized assessment system for purposes of individually configured education, a number of design requirements and features need to be handled with care and efficiency. These are concisely explicated below:

1. Construction of self-rating multiple intelligences assessment scale — this is a 4-point Likert scale of 120 items, i.e., 15 items for each of the eight intelligences (see Table 1 for some sample items).
2. Administration of the multiple intelligences assessment subscales — the items are arranged randomly in four subscales (each of 30 items making up a total of 120 items) and test administration time for each subscale is around 10–15 minutes.
3. Input of item responses into BRIDGES — items are scored 1–4 on the 4-point Likert scale; students should be given ample opportunity to attempt all items.
4. Item and reliability analyses — BRIDGES automatically conducts item and reliability analyses. For each item of the eight multiple intelligence constructs, item statistics (e.g., mean, standard deviation, and variance) and corrected item-total correlation are summarized. BRIDGES automatically discard bad items with negative corrected item-total correlation and flag non-discriminatory items with corrected item-total correlation less than 0.25. If these rules are followed, we know from our past research experiences that Cronbach-alpha of an intelligence construct of 15 items can attain a value of 0.7 or above (see Cheung, Tang, & Lam, 2003, for illustrations). This reliability measure indicates that at least half of the item variance of the intelligence construct is systematic and consistent. It is legitimate to base on these systematic and consistent variances to proceed to construct multiple intelligences profiles (MI-

spectrum). Should any one of the eight multiple intelligence constructs cannot meet this standard, the MI-spectrum concerned should be interpreted with caution. We should examine closely the response patterns of the students in detail instead.

5. Transforming measurements from norm-referenced into criterion-referenced — raw scores of the eight multiple intelligence constructs are banded by BRIDGES initially into four levels of progression in accordance with the quartiles of the score distribution; these graded bands may be refined further by adjusting the thresholds of the levels of progression so as to ensure that they are appropriately segmented for clear construct explication.
6. Interpretation of progression levels of multiple intelligences constructs — BRIDGES automatically analyzes the response behaviors of the sampled students. Cheung, Tang, and Lam (2003) have shown that if the above procedures are followed strictly, the item response patterns would be discernible for clear interpretation of the characteristics of the levels of progression.
7. Production of MI-spectrum and student counseling reports — BRIDGES produces multiple intelligences profiles, as well as reports of response

Table 1 Example of Self-Rating Multiple Intelligences Items

Type of Intelligence	Sample item
Linguistic (L)	I am able to use words to express my thoughts, emotion and needs.
Logical-Mathematical (LM)	I am able to carry out estimation, or undertake quick mental computation.
Spatial (S)	I like to play jigsaw puzzles, engage in maze games, and build blocks and models that needed imagination.
Bodily-Kinesthetic (BK)	I am fond of dismantling or assembling packages and objects.
Musical (M)	I am able to use actions to follow and express the rhythm of music.
Interpersonal (I)	I wish to work cooperatively with others, like role play and group activities.
Intrapersonal (J)	I am able to express my feelings and thoughts appropriately.
Naturalist (N)	I pay attention to the changes in the natural and surrounding environments, particularly to uncommon or mutable phenomena.

Original wordings of items are in Chinese.

patterns that are particular to the students. Assessment carried out in this way takes into account both the commonality and peculiarity of the students. All of the above-mentioned requirements and features (i.e., 1–7) are handled by BRIDGES automatically and efficiently.

Validation and Processing of Self-Rating Multiple Intelligences Data — An Exemplary Case Study

Item and Scale Analyses of Self-Rating Multiple Intelligences Data

As explained above, the measurement instrument used in this study is a 4-point self-rating Likert scale. There are 15 items for each of the eight multiple intelligence constructs. The full scale comprises of 120 items. Maximum score of each intelligence construct is 60 (i.e., 15 x 4) and minimum score is 15 (i.e., 15 x 1). The maximum range is therefore 45. In reality it is not possible to attain this maximum range. Cheung, Tang, and Lam (2003) revealed that range of score of the multiple intelligence construct is around 30, depending on the reliability of the construct concerned. This means that we can easily band the multiple intelligence constructs into four levels of progression so that there are 6 to 8 points difference to ensure that the graded bands are segmented for clear construct interpretation. In the present exemplary case study, Cronbach-alpha reliabilities of the eight intelligence constructs are: linguistic (0.807), logical-mathematical (0.812), spatial (0.776), bodily-kinesthetic (0.710), musical (0.836), interpersonal (0.841), intrapersonal (0.797), and naturalist (0.858). Because of the favorable reliabilities of multiple intelligence constructs, it is anticipated that sufficient systematic item variances are available for the construction of MI Spectrum.

Transforming Levels of Progression from Norm-Referenced Measurements into Criterion-Referenced Descriptions

BRIDGES is a computerized assessment system run on Microsoft windows Excel environment. It automatically validates the eight intelligence

constructs. After pruning bad items with negative discrimination (i.e., corrected item-total correlation smaller than zero), the total score of each of the eight multiple intelligence constructs is computed. Contrary to the most common practice of banding students with pre-determined cut-off scores, BRIDGES starts by banding the sampled students into four levels of progression in accordance with the quartiles (i.e., Q1, Q2, Q3) of the total scores of each of the eight multiple intelligence constructs. It is note-worthy that banding done in this way is essentially norm-referenced. In order to allow for a clearer interpretation of the progression levels, it is necessary to adjust the thresholds of the progression levels so that all levels are clearly segmented for construct interpretation.

Table 2 shows that after adjustment of the thresholds there are at least 6-8 point score differences between consecutive levels of progression for each of the eight multiple intelligences. This means that for a scale measuring a construct of 15 items, if a student's progression level is one level higher than that of his/her peer, then there is an average of 6 to 8 items (i.e., half of the number of items in a scale) the ratings of which are at least one point higher (i.e., one level higher in the 4-point Likert scale) than that of his/her peers. BRIDGES then proceeds to analyze the response patterns and peculiarities revealing how students of each level of progression rate themselves on the 15 items of each of the eight multiple intelligence constructs.

Table 2 Frequency Distribution by Levels of Progression of Multiple Intelligences of Sampled Students (*N* = 199)

Multiple Intelligences constructs	L	LM	S	BK	M	I	J	N
Thresholds of levels of progression								
From level 1 to 2	31	30	33	33	31	34	34	29
From level 2 to 3	38	36	39	40	39	41	42	36
From level 3 to 4	45	44	46	46	47	47	48	45
Frequency distribution by levels of progression								
Progression level 1	33	28	27	27	31	28	31	30
Progression level 2	73	72	81	81	74	83	81	71
Progression level 3	59	64	58	63	64	60	61	64
Progression level 4	34	35	33	28	30	28	26	34

The eight intelligences are: linguistic (L), logical-mathematical (LM), spatial (S), bodily-kinesthetic (BK), musical (M), interpersonal (I), intrapersonal (J), and naturalist (N).

Results of these analyses may be used to arrive at a clear and comprehensive interpretation of the levels of progression of each of the eight multiple intelligence constructs. In this way, BRIDGES transforms measurements from norm-referenced into criterion-referenced ones (see the caveat in the section below). The frequency distribution of students by levels of progression of each of the eight multiple intelligences are also summarized in Table 2. MI spectrum with comprehensive interpretation of progression levels, as well as response pattern reports for each of the eight multiple intelligences are available for counseling students and setting up of intelligence-fair learning environments (see Appendix A and B for some samples of assessment reports).

Three Caveats of Research Design

1. The first caveat is that although Gardner's theory of multiple intelligences is based on brain sciences, empirical support is still scant and inadequate (see Cheung, 2000, for a concise delineation of the neuropsychological foundation of the theory of multiple intelligences). BRIDGES as a computerized assessment software cannot autonomously supply brain-based recommendations for intellectual development and student counseling. Instead, BRIDGES should be further developed into a guidance and counseling approach/paradigm within which recommendations for intelligences exploitation and development are aimed to be brain-based as far as practicable (see Cheung, 2004b, for a detailed discussion of BRIDGES approach/assessment paradigm). Undoubtedly, Gardner's theory of multiple intelligences needs to be scientifically tested and proven further in brain science. In the educational arena, empirical evidence in support of the theory is still discernible (see Cheung, 2004c, for an explication).
2. The second caveat is that it is *not* the intention of the present study to compare between students within a school, nor to compare between schools in the target population. The study is meant to be school-based so that teachers attempt to know their students' intellectual potentials

and inclinations better through the self-report multiple intelligences questionnaire. Unfortunately, in assessing psychological attributes of which a sound theoretical base is lacking, the distinction between norm-referenced and criterion-referenced measurement of these attributes very often can only be an artificial one. This is because researchers need to use the norms in practice to inform them how the criteria should be set so that meaningful construct interpretation is possible. This is why the self-report questionnaire in the present study remains essentially a norm-referenced test with the norm being the group of test takers in a specific school under study. Nonetheless, the eight multiple intelligences constructs, once classified into clearly segmented graded bands, can be explicated and used to describe students' levels of progression. (see Cheung, 2002, for an explanation of the bridging and communication function of multiple intelligences profiles)

3. The third caveat is that validation of multiple intelligence constructs with achievement or performance-based measures is not a straight forward business. In an examination-oriented educational system, there is no logical reason to believe that these measures are necessarily linearly related, e.g., a student who reported very high linguistic intelligence should show comparable achievements and performance in language-related domains. While it is partly true that the computerized assessment program remains largely functioning as a self-reported questionnaire that is open to the subjective judgment of the students, it is important to point out that this assessment approach is also contingent upon the "errors" detected rendering the measurements less objective within certain acceptable limits in order to expose the individuality of the test-takers for purposes of student counseling (see Appendix B for an illustration). One main purpose of multiple intelligences assessment is to locate the strengths and weaknesses, i.e., the profiles of intellectual potentials and inclinations. The use of the BRIDGES approach through the use of self-rated questionnaires can be shown in an earlier study to serve this purpose well (Cheung, Tang, & Lam, 2003).

Science Stream and Gender Differences in Multiple Intelligences — An Exemplary Case Study

Stream of study (arts/science) and gender (boy/girl) are two important indicators that help educational practitioners examine whether the learning environments are intelligence-fair or not — an important issue pertaining to exploitation of human potentials and development of talents and personalities. Other indicators (e.g., examination results, misconduct) can be examined in similar manners. Reported below are research findings from the secondary school in the present study — a very established school in Macao that is highly regarded by both students and parents. The purpose of the ensuing two brief reports is to demonstrate the versatility of BRIDGES — it alleviates the burden of the school to undertake statistical analyses of large quantity of data collected in the study. More detailed analyses and follow-up studies are required for an evaluation of the meanings and implications of the research findings.

Science Stream Differences in Multiple Intelligences

Table 3 reveals that there are significant differences (p value < 0.05) in student proportion across the four levels of progression between the arts and science streams. This finding is applicable to four out of the eight multiple intelligences, namely linguistic (p value = 0.008), logical-mathematical (0.000), spatial (0.013) and the naturalist (0.000). Evidently, as far as the linguistic, logical-mathematical and spatial intelligences are concerned, there are higher proportions of science than arts students associated with higher levels of progression (i.e., 3 and 4). This superiority for the science students is also present at the highest progression level (i.e., level 4) of the other five intelligences (i.e., musical, bodily-kinesthetic, interpersonal, intrapersonal and naturalist). The results so far give us the impression that the arts students are educationally put in a less advantageous position. Fortunately, for the naturalist intelligence, there is relatively higher proportion of arts (34.4%) than science students (30.2%) at the third level of progression and

this pattern is also present in the bodily-kinesthetic and interpersonal intelligences. Overall, the impression is that the science students have a tendency to rate themselves highly on all the eight multiple intelligences, whereas the arts students have a tendency to regard themselves highly at the second best level of progression (i.e., level 3) of some intelligences that are not directly pertaining to science and technology.

Table 3 Comparison of Number of Students for Each of the Four Progression Levels of Multiple Intelligences Between the Two Streams of Study

Type of Intelligence	Progression Levels of Multiple Intelligences							
	1		2		3		4	
	Science	*Arts*	*Science*	*Arts*	*Science*	*Arts*	*Science*	*Arts*
L	11	22	36	37	34	25	25	9
[0.008]	*(10.4%)*	*(23.7%)*	*(34.0%)*	*(39.8%)*	*(32.1%)*	*(26.9%)*	*(23.6%)*	*(9.7%)*
LM	7	21	34	38	36	28	29	6
[0.000]	*(6.6%)*	*(22.6%)*	*(32.1%)*	*(40.9%)*	*(34.0%)*	*(30.1%)*	*(27.4%)*	*(6.5%)*
S	16	11	33	48	33	25	24	9
[0.013]	*(15.1%)*	*(11.8%)*	*(31.1%)*	*(51.6%)*	*(31.1%)*	*(26.9%)*	*(22.6%)*	*(9.7%)*
BK	13	14	41	40	31	32	21	7
[0.100]	*(12.3%)*	*(15.1%)*	*(38.7%)*	*(43.0%)*	*(29.2%)*	*(34.4%)*	*(19.8%)*	*(7.5%)*
M	14	17	36	38	36	28	20	10
[0.270]	*(13.2%)*	*(18.3%)*	*(34.0%)*	*(40.9%)*	*(34.0%)*	*(30.1%)*	*(18.9%)*	*(10.8%)*
I	13	15	45	38	28	32	20	8
[0.150]	*(12.3%)*	*(16.1%)*	*(42.5%)*	*(40.9%)*	*(26.4%)*	*(34.4%)*	*(18.9%)*	*(8.6%)*
J	15	16	40	41	34	27	17	9
[0.481]	*(14.2%)*	*(17.2%)*	*(37.7%)*	*(44.1%)*	*(32.1%)*	*(29.0%)*	*(16.0%)*	*(9.7%)*
N	11	19	34	37	32	32	29	5
[0.000]	*(10.4%)*	*(20.4%)*	*(32.1%)*	*(39.8%)*	*(30.2%)*	*(34.4%)*	*(27.4%)*	*(5.4%)*

p value of Pearson chi square significance test enclosed in square brackets; percentage of students of each of the four levels of progression within the two streams of study enclosed in round brackets; the eight intelligences are: linguistic (L), logical-mathematical (LM), spatial (S), bodily-kinesthetic (BK), musical (M), interpersonal (I), intrapersonal (J), and naturalist (N).

Gender Differences in Multiple Intelligences

Table 4 reveals that there is significant gender difference in student proportion across the four levels of progression and this finding is applicable to logical-mathematical intelligence only (p value = 0.000). It is evident that boys rated themselves more favorably than the girls on the logical-mathematical dimension. A similar but less evident pattern is also seen on the naturalist dimension. In spite of these, the superiority of the girls appears to lie on the linguistic and musical intelligences. This is because at the

highest level of progression (i.e., level = 4) there is a higher proportion of girls than boys. At the same time, there are lower proportions of girls than boys on the low end of progression (i.e., level =1) for spatial, musical and interpersonal intelligences. Furthermore, there are higher incidences of girls than boys at the second best level (i.e., level = 3) for both interpersonal and intrapersonal intelligences. As suggested by the course coordinators of the school, these gender difference results are not unexpected although additional information and data are needed for an adequate explanation.

Table 4 Comparison of Number of Students for Each of the Four Progression Levels of Multiple Intelligences Between Boys and Girls

Type of Intelligence	Progression Levels of Multiple Intelligences							
	1		2		3		4	
	Science	*Arts*	*Science*	*Arts*	*Science*	*Arts*	*Science*	*Arts*
L	16	17	40	33	35	24	16	18
[0.626]	*(15.0%)*	*(18.5%)*	*(37.4%)*	*(35.9%)*	*(32.7%)*	*(26.1%)*	*(15.0%)*	*(19.6%)*
LM	4	24	32	40	44	20	27	8
[0.000]	*(3.7%)*	*(26.1%)*	*(29.9%)*	*(43.5%)*	*(41.1%)*	*(21.7%)*	*(25.2%)*	*(8.7%)*
S	19	8	36	45	32	26	20	13
[0.090]	*(17.8%)*	*(8.7%)*	*(33.6%)*	*(48.9%)*	*(29.9%)*	*(28.3%)*	*(18.7%)*	*(14.1%)*
BK	12	15	42	39	34	29	19	9
[0.348]	*(11.2%)*	*(16.3%)*	*(39.3%)*	*(42.4%)*	*(31.8%)*	*(31.5%)*	*(17.8%)*	*(9.8%)*
M	19	12	39	35	37	27	12	18
[0.328]	*(17.8%)*	*(13.0%)*	*(36.4%)*	*(38.0%)*	*(34.6%)*	*(29.3%)*	*(11.2%)*	*(19.6%)*
I	16	12	46	37	27	33	18	10
[0.345]	*(15.0%)*	*(13.0%)*	*(43.0%)*	*(40.2%)*	*(25.2%)*	*(35.9%)*	*(16.8%)*	*(10.9%)*
J	16	15	45	36	32	29	14	12
[0.977]	*(15.0%)*	*(16.3%)*	*(42.1%)*	*(39.1%)*	*(29.9%)*	*(31.5%)*	*(13.1%)*	*(13.0%)*
N	16	14	34	37	35	29	22	12
[0.449]	*(15.0%)*	*(15.2%)*	*(31.8%)*	*(40.2%)*	*(32.7%)*	*(31.5%)*	*(20.6%)*	*(13.0%)*

p value of Pearson chi square significance test enclosed in square brackets; percentage of students of each of the four levels of progression for boys and girls enclosed in round brackets; the eight intelligences are: linguistic (L), logical-mathematical (LM), spatial (S), bodily-kinesthetic (BK), musical (M), interpersonal (I), intrapersonal (J), and naturalist (N).

Conclusions

BRIDGES is now under implementation and experimentation in a number of secondary and primary schools in Macao. It is also recently introduced to schools in Hong Kong, Taiwan and mainland China and received great attention. According to our observations, there are three good reasons for this initial success:

1. BRIDGES is based on Gardner's theory of multiple intelligences. Teachers and educators in the region subscribe to its basic idea that children are all intelligent in certain respects and it is important to exploit and nourish these potentials for an all-round life-long education. In addition, recent curriculum reform in China points to the need to develop school-based curriculum that develops each individual's potentials as fullest as possible. This paves the way for school restructuring along these reform directions.
2. BRIDGES is user-friendly and easy to use. The system is based on Excel and can be run on any Microsoft windows environments. All the analyses reported in this paper are automatic, facilitating the teachers to validate the multiple intelligences constructs before MI-spectrum and counseling reports are produced and issued to the students. Schools may use the MI-spectrum, together with the reports of stream and gender differences, to form learning groups for collaborative projects, to design co-curricular activities to exploit and develop students' potentials, to advise students on academic and career matters, etc.
3. Last but not least, this computerized assessment system is easy to be set up and is very much welcomed by the principals, teachers and parents. Testing time is around an hour only. Once the data are input into BRIDGES, the rest are handled completely by the system. Our experience is that a school of more than one thousand students can issue MI-spectrum to students within a few days' time. Schools may also use the gender and stream differences results to evaluate current streaming practices to see if the educational environment is intelligence-fair or not.

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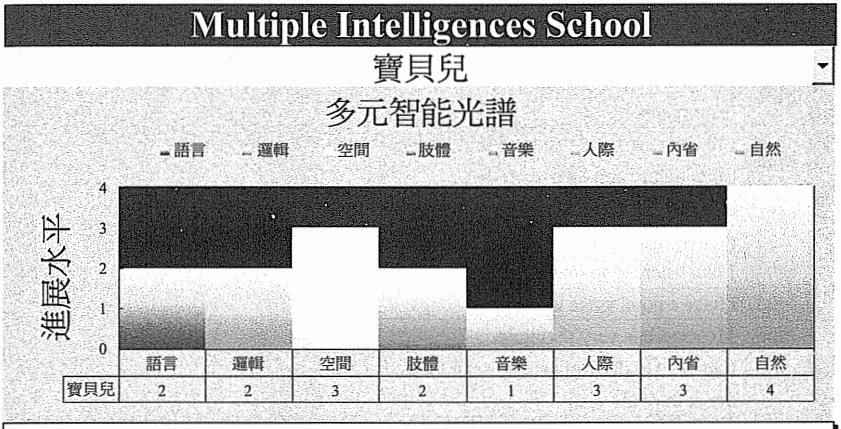
Appendix A

A Sample of Multiple Intelligences Spectrum of a Typical Student (In Chinese)



寶貝兒 同學:

語言智能: 符合基本要求 (偶爾會善記人名、地點、日期或瑣事細節；學習語言稍爲快速；略能看圖說故事，偶爾用豐富詞彙編寫故事；有時會朗讀課文和聽講故事；略能運用所學的字、詞和句式寫作；略爲喜愛討論、辯論等應用語言文字的活動。)

邏輯數學智能: 符合基本要求 (有時能用多種方式解題，思想略爲靈活；略爲喜歡尋找事物的規律、形式及邏輯順序；略懂得估算，或進行快速心算；稍爲喜歡利用計算機、電腦解題和參加計算遊戲；又稍爲喜歡數學課，參與數學和科學活動；有時喜歡將事物統計用表列出。)

空間智能:相當滿意 (較容易憑記憶將家中的擺設畫出來；較喜愛玩拼圖、走迷宮、堆積木或砌模型等想象遊戲；對色彩比較敏感；較能夠輕鬆地想象一個事物的景象；較喜歡看電影和其他視覺藝術表演；會選擇材料、用具，依自己意念進行設計創作。)

肢體動覺智能:符合基本要求 (少許容易利用動作表達一件物件或食物的名稱；與人談話時，有時用手勢或其他形式的身體語言；稍爲善於模仿他人的動作、言談舉止；亦稍爲善於動作模仿，活潑生動；略善於協調各部分身體動作；較喜愛驚險娛樂的活動或身體刺激遊戲。)

音樂智能: 有待提高 (不會彈奏一種或多種樂器；不感到自己有個好聽的歌喉；講話時不是很有節奏感；沒有參加樂隊、合唱團；不知道很多歌曲和樂曲的旋律；不會自行作詞、譜曲以抒發情感。)

人際智能: 相當滿意 (是同學較爲喜歡合作的對象；較懂得關心、體諒和幫助別人；較樂意接納別人的意見；比較會傾聽別人的說話，較懂得互動，溝通比較良好；較喜歡與他人交往，有較多朋友，在社交聚會中顯現好的領導才能；較具團隊精神，尚盡職又努力奉獻。)

個人內省智能: 相當滿意 (較能適切表達自己的感受和想法；認爲自己較誠實、坦白、勤於反省、勇於認錯、明事理、擁有自尊、懂得自律、能集中注意力、依時完成工作；較善於計劃和分配日常生活時間；亦較會檢討自己做事成功或失敗的經驗，使下次做事更爲順利。)

自然觀察者智能: 十分好 (對植物、動物、自然生態環境有好奇心、保護意識和關懷之情；會留意自然環境和周圍生活環境的變化，特別是突變和不尋常現象；喜歡使用儀器來探究自然世界；善用自然世界(例如：垂釣、烹飪)和樂於分享自己探索自然萬物的經驗；對自然景物有很大的興趣；在往返學校的路途上，喜歡觀察周圍的景物，並且注意其不同的變化。)

Note: There are altogether four levels of progression for each of the eight intelligences. Interpretation of the progression levels is based on the analysis results made by BRIDGES. Schools need to rephrase the interpretation to facilitate communication with students and parents. As such, the MI-spectrum is criterion-referenced.

Appendix B

A Sample of Musical Intelligence Response Pattern Report of a Typical Student

Item	Musical Intelligence	Dis-agree	Slightly Agree	Almost Agree	Agree
M01	I am able to play one or more musical instruments.	# +			
M02	I like to sing freely, and use limbs to tap beats lightly and inadvertently.	+		#	
M03	I like to whistle, and engage in singing and playing activities.	# +			
M04	I like listening to music.	#	+		
M05	I have a good voice to sing nice songs.	+	#		
M06	My speech is very rhythmic.	+	#		
M07	I am able to discriminate musical tunes that are not at the right pitch.	+			#
M08	I am able to use actions to follow and express the rhythm of music.	+	#		
M09	I join the choir and orchestra.	# +			
M10	I find that music of television programs sometimes enter my mind while I am walking.		# +		
M11	I know a lot of songs and the melody of music.	# +			
M12	Accompanied by music, I feel heartened and can finish work more attentively and quickly.	#	+		
M13	Generally I am able to sing a song correctly even though I listen to it once or twice.		+	#	
M14	I am able to compose the lyric of a piece of music so as to express my feeling and emotion.	# +			
M15	I am able to listen to the inner meanings and appreciate the background of a piece of music.	# +	+		

Note: There are altogether eight reports for each of the multiple intelligences. Teachers can use these reports to counsel students and inquire about peculiar responses made by the students. The "#" sign indicates responses made by the student and "+" sign points out the most probable response made by students of the same level of progression as the student reported here.