The Development of Multiple Talents: Conceptualization and Empirical Studies

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A 4-year joint research project (1999-2003), entitled "The Development of Multiple Talents (DMT)", has been designed and carrying out under the sponsorship of the National Science Council, R.O.C. (Taiwan). A 3-dimension construct is proposed for the DMT: form of talents (10 forms, mainly based on Gardner's theory of multiple intelligences), function of talents (3 functions, based on Sternberg's conception of successfulintelligence), and developmental stage (4 stages, from pre-school to senior high).

To take an example of its empirical studies, Wu and Chien (2000), based on a renovated conception of personal intelligence, developed the "Personal Intelligence Inventory" (PII). By means of the PII, it was found that there were some personal intelligence differences between gifted and regular pupils; however, gifted group was not as superior as on academic performance to the regular one (Wu & Chien, 2000). It was also found that there were significant relationships between pupils'personal intelligence and school adjustment in both groups (Tsai & Wu, 2000).

Ⅰ. Rationale and Research Model

It is believed that Gardner's (1983,1993) theory of Multiple Intelligences (MI) has its universal meaning. However, when it is applied to appraisal and teaching, cultural and social factors have to be taken into account. In other word, it has to be studied, experimented, and evaluated locally. A 4-year joint research project(1999-2003), in the name of the "Development of Multiple Talents" (DMT), has thus been designed and carrying out under the sponsorship of the National Science Council, R.O.C. (Taiwan).

The DMT research model has three dimensions (refer to Figure 1): form or content of talents (10 forms, mainly based on Gardner's MI theory), function or operation of talents (3 functions, based on Sternberg's conception of successfulintelligence), and developmental stage (4 stages, from pre-school to senior high). There are 16 sub-studies, in five themes, based on talent domains and developmental stages. Thefive sub-themes are: (1) the identification/appraisal of multiple talents, (2) the existing models/programs of DMT, (3) the design of DMT programs in Taiwan school settings, (4) the effectiveness of the DMT programs, (5) the establishment of DMT systems in Taiwan. The research team is consisted of 9 scholars in gifted education and 15 experts in specific talent domains. The former arein charge of the sub-studies, whiles the latter are served as research consultants. There are two stagesof this integrated study: (1) The first 2-year stage, focusing on talents identification and appraisal; (2) The second 2-year stage, focusing on DMT program/curriculum design, experimentation and evaluation.

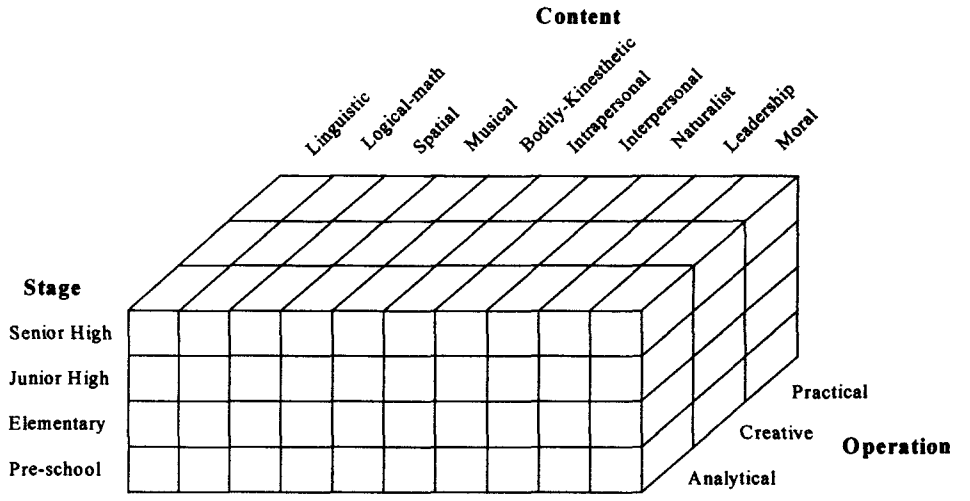

Figure 1. A Proposed Model of the Development of Multiple Talents (DMT)

II. An Example : Conception and Appraisal of Personal Intelligence

To take an example, in the first stage, in one of the sub-studies entitled "The appraisal and development of personal intelligence" (Wu & Chien, 2000), an integrated model of personal intelligence (PI) is proposed based on Thorndike's classical social intelligence, Gardner's conception of personal intelligence in his theory of multiple intelligences, Goleman's emotional intelligence, and Chinese cultural point of view. Wu and Chien (2000) have redefined the conception of personal intelligence as the "intrapersonal, interpersonal and interactive abilities":

A. Intrapersonal abilitys is an ability to self-aware, self-examine, self-regard and self-adapt.

B. Interpersonal ability is an ability to be empathic to, respectful to, amiable to, and guiding others.

C. Interactive ability is an ability to be humorous, tolerate, appropriate role-playing, and conflict-solving.

Personal intelligence can be described as core of requirements of a successful career and analyst of the other constructs of intelligence. (refer to Figure 2). A successful career is to be achieved jointly by academic intelligence, practical intelligence, creative intelligence, and personal intelligence (a combination of intrapersonal intelligence and interpersonal intelligence), whiles personal intelligence plays a core role.

Figure 2 illustrates the following:

a. There are four types of intelligence that lead to a successful career, i.e., the traditional intelligence (analytical intelligence or academic intelligence) and the other three non-academic intelligences personal intelligence, practical intelligence, and creative intelligence. A balanced development among these four types of intelligence can make a successful career and fulfillment of life.

b. There is a close relationship between academic intelligence and achievement in different academic subjects. Different kinds of academic intelligence can influence achievement in different subjects, such as linguistic intelligence for literature, logical-mathematical intelligence for math and science, musical intelligence for music, spatial intelligence for fine arts, and bodily-kinesthetic intelligence for sports, dancing, and drama

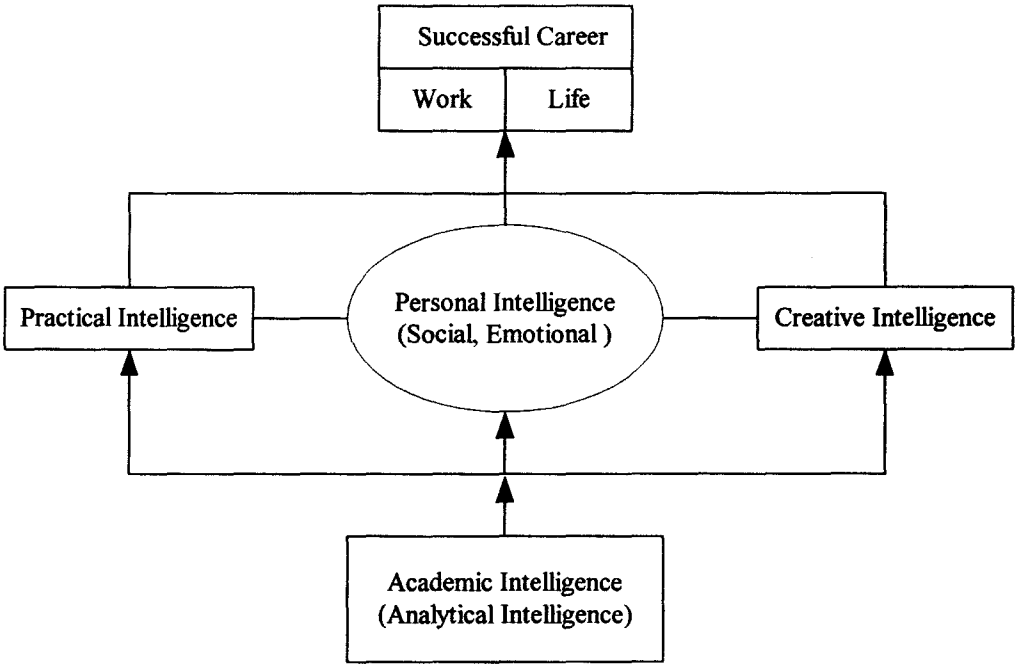

Figure 2. The Relationship of Successful Career and Successful Intelligence

c. Personal intelligence may be referred to as social intelligence or emotional intelligence, which involves intrapersonal intelligence and interpersonal intelligence.

d. Practical intelligence belongs to the field of cognition. It is an ability to apply knowledge to daily lifeor problem solving.

e. Creative intelligence includes creative thinking (cognition) and creative attitude (feeling). Sternberg (1996) believes that creative intelligence and practical intelligence have more impact on career achievement than does academic intelligence (traditional intelligence). Creative intelligence can be integrated with the executive ability of practical intelligence to produce stronger power or concrete effect, such as a creative problem-solving.

f. Academic intelligence is the basic requirement of a successful career, but it is not sufficient. A successful career (a successful job and contented life) requires a balanced development of the above four types of intelligence. On the other hand, personal intelligence is the core of achieving a successful career and the catalyst for the other constructs of intelligence.

Based on the renovated conception of personal intelligence, the "Personal Intelligence Inventory" (PII) was developed.The 72 items of PII are all situation-oriented. There are three forms of PII: Form A is in the form of multiplechoice, Form B is an open-ended questionnaire, Form C is a very individual experience-based questionnaire. All forms measure the same construct of personal intelligence (three domains, with 4 sub-scales for each domain) with the same criteria, using a 4-point rating scale. Based on the sample of 620 grade 5 and 6 pupils in the Taipei area, the reliability of the PII was satisfactory. The inter-domain and the inter-subscale correlation coefficients were high and significant refer to Table 1). The test-retest reliabilities of the total scale forForm A was .80, whiles the three domains were .66, .61, and .75, respectively. The inter-rater reliabilities for the total scale and domain scales of Forms B and C were also around .80. However, it is somewhat affected by "social desirability". The correlation coefficients between the PII and the Social Desirability Scale were .29 ($p<.05$) for the total PII score and .36 ($p<.01$), .15 ($p>.05$), and .28 ($p<.05$) for the three PII domain scores (Intrapersonal, Interpersonal, and Interactive), respectively.

Wu and Chien (2000) used the PII to assess the 5th and 6thelementary school gifted and regular pupils (total N=620) in the Taipei area. It was found that traditional intelligence and gender did have significant effects on personal intelligence. The multivariate analysis showed significant Wilk's Lambda values (s), .946 ($p<.01$) and .932 ($p<.01$), respectively, for both trafitional intelligence and

<Table 1> Reliabilities of Personal Intelligence Inventory

	Test-retest		Inter-rater	Forms A-B
	Form A (n=56)	Form B (n=62)	(n=38)	(n=62)
Intrapersonal	.66	.52	.72	.52
Interpersonal	.61	.57	.70	.57
Interactive	.75	.56	.78	.56
Total	.80	.65	.81	.65

gender variables; there were no significant interactions. In terms of intelligence group, the gifted students' interpersonal ability ("guiding others", in particular) was better than regular ones (Table 2)in terms of gender factor, girls' intrapersonal abilities? "self-retrospection", in particular? and interpersonal abilities? "being respectful" and "being amiable to", in particular? surpassed boys', while boys only showed better than girls in "being humorous" in the interactive dimension (Table 3).It is interesting to note that it seems that gifted group, although in general is in a better position, is not as superior as on academic performance to the regular one.

<Table 2> Means and SDs of Gifted and Regular Groups on Personal Intelligence Inventory Scales and Summary of ANOVA

		Gifted Sudents		Regular Students		
		M	SD	M	SD	ANOVA(F)
Intrapersonal	Self-Awarene	18.75	3.00	18.72	2.75	.01
	Self-Retrospecti	18.86	3.48	19.11	3.00	.86
	Self-Regard	19.42	2.83	19.39	2.77	.03
	Self-Adaptation	19.24	3.04	18.99	3.36	.98
	Intrapers. Total	76.24	12.35	76.71	11.88	.06
Interpersonal	Empathic	17.93	3.74	17.71	3.55	.21
	Respectful	20.27	3.20	19.85	3.25	.11
	Amiable	19.08	3.07	19.16	3.07	2.67
	Guiding	17.75	3.07	16.72	2.76	19.10**
	Interpers. Total	75.03	13.08	73.44	12.63	7.62*
Interactive	Humorous	15.88	3.39	15.38	3.13	3.65
	Tolerate	18.06	3.42	17.99	3.33	.00
	Appropriate Role-Playing	19.16	3.04	19.04	2.93	.24
	Conflict-solving	17.45	3.94	17.85	3.88	1.67
	Interactive Total	70.50	13.79	70.26	13.27	.02
Total Scale		221.80	39.22	220.41	37.78	5.12*

*p<.05 **p<.01

<Table 3> Means and SDs of Boy and Girl Groups on Personal Intelligence Inventory (PII) Scales and Summary of ANOVA

		Boys		Girls		
		M	SD	M	SD	F
Intrapersonal	Self-Awereness	18.71	2.89	18.77	2.85	.07
	Self-Retrospection	18.66	3.28	19.61	3.11	12.05**
	Self-regard	19.32	2.64	19.58	3.06	1.34
	Self-Adaptation	19.01	3.15	19.31	3.29	1.61
	Intrapers. Total	75.69	11.96	77.27	12.31	6.48*

	Empathic	17.64	3.56	18.17	3.78	2.86
	Respectful	19.83	3.30	20.49	3.05	5.75*
Interpersonal	Amiable	18.94	3.15	19.48	2.88	4.36*
	Guiding	17.08	2.85	17.54	3.16	3.36
	Interpers.Total	73.49	12.86	75.68	12.87	4.15*
	Humors					
	Tolerate	15.86	3.20	15.20	3.35	5.65*
	Appropriate	17.94	3.39	18.11	3.34	.34
Interactive	Role-Playing	18.96	3.04	19.37	2.86	2.70
	Conflict-Solving	17.53	3.95	17.94	3.92	1.74
	Interactive	70.29	13.58	70.62	3.47	.78
	Total					
전체		219.47	38.40	223.57	38.65	6.54*

*p<.05 **p<.01

In another study, using PII and the School Life Inventory, devised by Wu (1997), to assess elementary school gifted and regular pupils, Tsai and Wu (2000) found that traditional intelligence and gender also had significant effects on school adjustment, there were also significant relationships of personal intelligence and school adjustment in both gifted students (R=.46) and the regular ones (R=.40) (Tables 4 & 5).

<Table 4> Correlation Matrix of Personal Intelligence Variables and School Adjustment Variables of Gifted Students

	Intrapersonal				Interpersonal				Interactive			
	SAwa	SRet	SReg	Sada	Empa	Resp	Amia	Guid	Humo	Tole	ARPI	CSol
Studiousness	.26**	.24**	.23**	.30**	.24**	.21**	.29**	.22**	.16**	.22**	.30**	.34**
Compliance	.24**	.29**	.19**	.21**	.27**	.27**	.19**	.22**	.15**	.27**	.17**	.27**
T-S Relat.	.35**	.32**	.32**	.37**	.30**	.27**	.39**	.28**	.26**	.33**	.26**	.37**
Peer Relat.	.19**	.25**	.26**	.23**	.23**	.23**	.20**	.21**	.24**	.24**	.16**	.24**
Self-Accept.	.26**	.18**	.33**	.27**	.21**	.18**	.18**	.16**	.24**	.27**	.16**	.23**
R=.46**												

N=310 *p<.05 **p<.01

<Table 5> Correlation Matrix of Personal Intelligence Variables and School Adjustment Variables of Regular Students

	Intrapersonal				Interpersonal				Interactive			
	SAwa	SRet	SReg	Sada	Empa	Resp	Amia	Guid	Humo	Tole	ARPI	CSol
tudiousness	.23**	.21**	.21**	.27**	.14**	.27**	.19**	.16**	.15**	.20**	.25**	.13*
Compliance	.18**	.20**	.09	.20**	.19**	.23**	.21**	.11**	.16**	.16**	.20**	.14*
T-S Relat.	.34**	.29**	.34**	.35**	.30**	.29**	.36**	.23**	.26**	.27**	.29**	.27**
Peer Relat.	.17**	.19**	.22**	.24**	.12**	.21**	.19**	.11	.20**	.13*	.17**	.22**
Self-Accept	.16**	.10**	.35**	.26**	.16**	.16**	.19**	.09	.28*	.22**	.16**	.20**

R=.40**

N=310 *p<.05 **p<.01

The current studies showed that the newly developed PII is a useful tool in assessing intrapersonal, interpersonal, and "interactive"intelligences. The preliminary research findings indicate the importance of personal intelligence in educational process and career development. In the field of gifted education, there has been much attention on the social/emotional development of gifted students and it is evidenced that there is a great need and a big room for gifted students in this regard.

Ⅲ. Conclusion

There is a Chinese saying that "Every one's potential is useful in some way"?—NkΩ?Ⅲ┬Ξ?. No matter how smart or stupid a student is, he or she should have his/her merits and disadvantages along with different learning needs. A teacher must learn how to discover their students' diverse characteristics and needs and how to teach diversity through variety in order to realize an ideal of "school without failure". This is, of course, a great challenge.

The theory of multiple intelligences (talents) and the practice of multiple (varied) instructional methods may be the key of resolution. We anticipate that the MI model will have to be incorporated into a well established educational reform, curriculum reform in particular, so as to bring out a new era ∠not only "educational for all," but "excellence education for all.

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