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**Self-knowledge Education: Educating gifted children in Singapore on their
hemispheric functioning**

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ABSTRACT

With the advent of a new millennium, new forms of education are needed to meet the exigencies of the times. This paper proposes to include human education, specifically the education on self-knowledge, in the school curriculum as a catalyst to speed up the development of gifts and talents and hence the realisation of human potential. The entire series of self-knowledge lessons include knowledge of the gifted pupil's character composition, brain functioning preferences and intellectual attributes, moral and volitional attributes, social abilities, and other personal and inter-personal skills. A total of 497 Primary 5 pupils in nine schools hosting the Gifted Education Programme (GEP) in Singapore were taught a series of self-knowledge lessons over a one-year period. This paper will discuss the profiles of the gifted pupils in terms of their preferred hemispheric functioning and how such awareness could enhance their academic performance.

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Introduction

Since time immemorial, education has always been considered as the most fundamental factor or cause of civilisation. That form of education which could exert a lasting effect however needs to be comprehensive and adequate in providing not only for the physical and intellectual aspects of man but also his spiritual/moral/ethical and emotional needs. As we proceed into the 21st century, we also need to respond to the challenge of providing the younger generations with knowledge and skills to participate in a global economy. At the dawn of the digital age, the acquisition of knowledge in science and computer technology in schools has been intensified while learning about the humanities appears to take on a more peripheral role.

Curricular change accompanying globalisation is inevitable. Worldwide attempts have been made to ensure that students become "computer literate". Teachers have been encouraged to use simulations, multimedia resources, databases and computer-assisted learning modalities in their respective disciplines. Students are expected to master software applications to help them develop and enhance skills in such areas as writing, problem solving, research and communication. An examination of a sample of school curriculum in the world reveals interesting trends. The Canadian secondary school curriculum for example includes "career education", "co-operative education", "education on other workplace experiences", and even education on "health and safety" (Ministry of Education and Training, Ontario, 1999). The Hong Kong curriculum caters for art, Chinese, computer, English, Mathematics, music, science, social, and moral and civics education (Cheng, Chow and Tsui, 2000). The Singapore schools provide training in computer literacy, science, humanities, art, music, physical education, civics and moral education, co-curricular activities and more recently, character building. At any point in time, new curricula are being developed to cater to the students' needs in particular countries, the common aim of which is none other than to usher in a more advanced civilisation, and to bring mankind to greater heights of development.

It is clear that education is consistently characterised by curricular change. The only element that ironically remains "unchanged" is the human factor, namely the students themselves. There is no doubt that as the years go by, the students have become intellectually more able (see "Flynn effect", in Begley, 2001). Nevertheless, the nature of talents and their development somewhat follow incompatible trends. Should the students be directly taught to acquire self-knowledge consciously, the impact of the curricular changes will be enhanced,

for the aims of curriculum development also include the liberation of human potential. Unlike advocates of humanism in the fourteenth and fifteenth centuries, this paper suggests the implementation of self-knowledge classes as a form of "human education", or the education on what it means to be human. Progressive educators will agree that education for 'the whole child' is only made complete with the additional element of educating the child about the self.

Background to the study

The Singapore education system aims to prepare the young to meet future challenges and to grow up to be useful and responsible citizens. True loss is indeed for one whose days have been spent in utter ignorance of the self. Gardner (1983) has defined intrapersonal intelligence as introspective capacity or self-knowledge. A continual development of this capacity may hypothetically produce a mature sense of self and inner wisdom. Logically, the developmental process of inner growth that leads to profound self-knowledge cannot come by chance and is surely not accidental. The root cause of wrongdoing is ignorance, and educators must be prepared to use the tools of perception and conscious knowledge to eradicate it. Therefore children, or children with gifts and talents in this study, need to be taught about their selves. They can then *choose* to act in a manner that will develop their potential on their own volition. The assumption is that each child prefers to labor to align his life with the ideal of becoming a better person; and that there is *volition* or *will*, not a mere wish, to change oneself for the better.

To wish and to will. Our worst faults are the consequences of confusing the two things. --Henrik Ibsen

(in Lieberman, 1985, p. 227)

Lieberman (1985), while studying the life and work of Otto Rank, a psychoanalyst, cited a clear distinction between "will" and "wish" as expounded by Rank and Freud.

Will, for Rank, is the integrated personality as original creative force, that which acts, not merely reacts, upon the environment. Rank's "will" has nothing in common with the Freudian "wish" in that it is actually effective, not a passive element in a deterministic chain. The will of the individual, as Rank conceives it, is in itself a first cause and produces something new. ... Will is not merely the drive of a predominant instinct or combination of instincts, it is that central integration of the forces of the individual which exceeds the sum of the parts, a unity which can inhibit as well as carry through to realization the instinctual urges. ... (in Lieberman, 1985, p. 357)"

Rank, in *Will Therapy*, cited by Lieberman (1985, pp. 357-8), defined will as "a positive guiding organization and integration of self which utilizes creatively, as well as inhibits and controls the instinctual drives." In the study, will or volition is that human attribute which bridges the gap between knowing/wanting (wishing) and action. It is the force that generates, propels and fuels actions and deeds intended by the self. It is goal-striving, not goal-setting (or motivation) (Ach, 1935; Kuhl, 1984; Cross and Markus, 1990).

The mere empowerment of pupils with self-knowledge alone is insufficient in this project whose theme is the development of self-knowledge, volition and action of gifted pupils which may later lead to self-actualization. A simple example is that we may know that international

peace is good, that it is conducive to human welfare, but volition and action are necessary before it can be established.

Nevertheless, the paper reports on part of a major study that proposes to include human education, specifically the education on self-knowledge as a catalyst to speed up the development of gifts and talents and hence the realization of human potential. A total of 497 Primary 5 (P5) pupils in the Gifted Education Programme (GEP) in Singapore were taught a series of self-knowledge lessons. These lessons included instruction on the character make-up, intellectual functioning, volitional attributes, social abilities, and other personal skills. In short, they included self-knowledge on one's cognitive, affective and volitional capacities. This paper describes the profiles of a P5 cohort of gifted pupils in terms of their preferred hemispheric functioning and how such awareness could enhance their academic capacity. These self-knowledge lessons on mental functions and brain preferences were an integral part of the entire series of self-knowledge lessons taught to gifted pupils.

Some Definitions:

Self-knowledge

In this study, the knowledge of the degree of functioning of human faculties pertaining to the "self" constitutes self-knowledge (Teo and Quah, 1999; Banaji and Prentice, 1994) or intra-personal intelligence as defined by Gardner (1983). Basic human faculties include the capacities to know, to will and to love; or the power of cognition, volition, and affection (Danesh, 1994). Other faculties include the power of understanding, the power of memory, the power of discovery, the power of thought (including both critical and creative thinking), power of visualisation, etc. As a person acquires self-knowledge, his awareness and understanding of the extent to which these faculties, or powers, are within his command increase. The freedom and ability to use these powers provide the basis for rational and moral choices, self-regulation of emotions and the right to act independently. Definitions of the basic faculties as interpreted by the authors are given below.

The Cognitive capacity or mental power

Cognition is the power of knowing. It is knowledge, consciousness, and acquaintance with a subject and the investigation of truth. The power of knowing taken in its widest sense includes sensation/perception and intuition, as distinguished from feeling and volition. The attainment of self-knowledge is simply being able to know yourself, or having greater self-awareness or consciousness, and then being able to use this knowledge to form judgements and to make choices.

The Volitional capacity or will power

Volition or will is the power of choosing or making a decision that ultimately determines action (Teo and Quah, 1999). It is *not* synonymous with motivation in this study. It is also often referred to as "moral choice" when a person decides on the course of action between "good and evil". It has been noted however that this freedom of will is not absolute. Inevitably, a person has no choice of parents, ageing, disease, sleep or death (Danesh, 1994). Will power is also seen as "a system of psychological control processes that protect concentration and direct effort in the face of personal and/or environmental distractions" (Corno, 1993, p. 16). It is simply one's capacity for self-regulation or self-control.

Whole brain functioning attributes

Hemispheric asymmetry theory has its origins in the research that Roger Sperry performed in the 1960s. The human brain comprises two hemispheres, namely the right and left brain, which process information in different manners. Left-brained people are characterized as somber, critical, and serious, while right-brainers are supposed to be free-spirited, emotive, and creative. When information is processed interactively between the right and the left hemisphere of the brain, we say that the person is utilising whole-brain processes (Torrance, 1988; Ranpura, 1999).

Left-brain dominant attributes

The left-brain processes ideas and thoughts in a sequential, linear, logical and analytical way with a time sense. People who prefer left-brain functions tend to be systematic, orderly, organised, structured, verbally or linguistically inclined. They prefer words to pictures while operating in logical modes of step-by-step deduction. They study better with course outlines enumerating key points in sequential order (Torrance, 1988; Ranpura, 1999).

Right-brain dominant attributes

The right-brain processes information in a visual-spatial, non-linear, random, holistic, simultaneous and non-verbal mode. People with right-brain preferences are imaginative, visual, spatial, dreamy, creative and not very well-organised or orderly. They prefer mind-maps and pictures to audio or verbal presentations. They learn better with course summaries and understanding of relationships (Torrance, 1988; Ranpura, 1999).

Singaporean schooling adolescents are reported to be mainly left-brained (Lee & Yeap, 1995). Brain profiles of young gifted pupils in Singapore will be examined in this paper.

Methodology

Subjects

In an attempt to promote efforts by the Ministry of Education (Singapore) in developing an ability-driven education system (Ministry of Education, 1999), the researchers have embarked on an experimental study to teach Primary Five (P5) pupils in the Gifted Education Programme (GEP) self-knowledge lessons. As Primary Four (P4) gifted pupils have just entered the GEP and are still adjusting to their new school environment, while Primary Six (P6) pupils are expected to prepare for the major Primary School Leaving Examination, this leaves the researchers with P5 pupils as experimental subjects. The nine primary schools which house the GEP are: Anglo-Chinese School (Primary), Catholic High (Primary) School, Henry Park Primary School, Nan Hua School, Nanyang Primary School, Raffles Girls Primary School, Rosyth School, St. Hilda's School (Primary) and Tao Nan School. The distribution of the gifted pupils in each school is given in Table 1.

Table 1 Distribution of Primary 5 GEP pupils in the year 2000 (N=497)

No. of classes Male Female Total

School

Anglo-Chinese 2 47 - 47

Catholic High 2 40 - 40

Henry Park 2 31 13 44

Nan Hua 2 34 15 49

Nanyang 3 46 33 79

Raffles Girls 3 - 73 73

Rosyth 2 29 26 55

St. Hilda's 2 17 15 32

Tao Nan 3 54 24 78

Total 21 298 199 497

Note: Anglo-Chinese School and Catholic High School are boy schools and Raffles Girls' Primary School is a girls' school.

Procedures

In the year 2000, the project began with the first author going into all the Primary 5 GEP classes to deliver the 'intervention' package of self-knowledge lessons, a five-module series covering theme units on character; characteristics and development of the mind or intellect; characteristics and development of volitional attributes; characteristics and development of affective, social and emotional qualities; and finally time and stress management. Topics like knowledge of one's inherited, innate, acquired, and moral character, as well as essential qualities for resolving interpersonal disputes were also discussed with real life examples such as stories reported in newspapers. The two lessons related to one's cognitive attributes, hemispheric functions and preferences are described later.

Instrumentation

Two instruments were used in this study. The first instrument is a newly devised Self-Knowledge Checklist (SKC) with a reliability coefficients of .947 (n=1042). The second instrument is the Style of learning and thinking or SOLAT (Youth form) (Torrance, 1988). It is a self-report inventory with 28 questions and Cronbach alphas of .77 for the left-brained scale and .74 for the right-brained scale. Students who indicated both the left and the right-brained descriptors are classified as having whole-brained functions.

The intervention

The intervention consisted of five one-hour lessons conducted over five consecutive weeks during the "Civics and Moral Education (CME)" time slot early in the morning from 7:30 a.m. to 8:30 a.m. Classes were scheduled on each weekday morning in alternate terms for each school. For example, the researcher would teach P5K GEP pupils in Nan Hua on Mondays in term 1 and P5J GEP pupils in Nan Hua in term 3. She would teach Anglo-Chinese School GEP pupils on Tuesday mornings, Tao Nan School GEP pupils on Wednesday mornings, Nanyang Primary School GEP pupils on Thursday mornings and Raffles Girls' Primary pupils on Friday mornings. While self-knowledge lessons were taught in the respective schools, GEP pupils who were not yet taught the lessons were left in baseline conditions, that is, they continued to have the usual CME lessons prescribed for all schools in Singapore.

Self-knowledge lessons

(i) The human character make-up (composition):

This lesson comprised a sharing of medical research findings on twin studies revealing the inherited, innate and acquired characters of human beings. The concept that human beings may be viewed as a composition of heart (emotion), body (physical), mind (intellectual) and soul was discussed together with graphs to explain developmental stages and maturation. The theory that human beings have multiple intelligences, that gifts and talents are like invisible fruits (invisible potential), and that living organisms need to grow holistically in all aspects were also expounded. Pupils were urged to set personal goals of growth. Pupils were then given the "Style of Learning and Thinking (SOLAT) (Youth Form)" to check their brain preferences in preparation for the next lesson on the development of the brain and mind. The SOLAT is a self-scoring inventory.

(ii) Characteristics and development of the mind or intellect (cognitive powers):

Results of the SOLAT were checked and returned to pupils so that insights into applications of reported brain preferences in real life could be discussed. Characteristics of critical and creative thinking, their respective functions, meaning of IQ, channels of knowing, validation of truth, the transfer of Cattell's primary and secondary factors of human abilities into classroom practices and factors of enhancing thinking were discussed together with the power of a focussed mind in discovery learning. The use of classical music, IQ games and thought-provoking or challenging questions in stimulating the development of the mind were also discussed. Pupils were taught to understand the concept of "atrophy" when a person did not exercise his intellectual powers.

The progress of pupils was tracked over a one-year period. The effects of self-knowledge education of gifted pupils with regard to brain functioning on academic performance are still being analyzed at the time of report of this paper. The brain profiles of the gifted pupils, however, are reported below.

Results

Raw scores on the SOLAT were first converted to standard scores using the conversion scale provided by Torrance (1988). A research assistant then entered the left-, right- and whole-brained scores for each gifted pupil into Microsoft Excel files. A total of 460 valid cases were documented. These were transferred into SPSS files. All scores greater than

120 were chosen as "clear" brain-dominant indicator and categorized into "clearly right-brained", "clearly left-brained" and "clearly whole-brained" groups before an ANOVA was run to check if there were significant differences in brain-dominant scores.

Table 2 gives an indication of means and standard deviations of the standard scores for all 460 subjects while Table 3 provides results of the one-way ANOVA.

Table 2 Frequency distributions of left-, right- and whole-brained SOLAT scores

Standard SOLAT brain preference scores

n = 460 whole- left- right-

brained brained brained

Mean 81.89 67.87 99.41

Standard deviation 22.06 18.33 21.07

Table 3 ANOVA and mean table for brain-dominant SOLAT scores ≥ 120 (n = 123)

n % Mean SD

whole-brained 32 26.02 129.78 11.94

left-brained 3 2.44 122.00 2.00

right-brained 88 71.54 130.84 9.11

Sum of Squares df Mean Squares F Sig.

Between groups 240.73 2 120.36 1.24 .293

Within groups 11645.24 120 97.04

Total 11885.97 122

Discussion

Results reported in this paper indicate that a sampled cohort of GEP or gifted pupils in Singapore comprises mainly of right-brained pupils (71.54%) while the mainstream pupils were mainly comprised of left-brained pupils (Lee & Yeap, 1995). This means that GEP classrooms at the primary level, especially P5s, consist of global, imaginative and visual-spatial personalities. Teachers, curriculum developers and parents may like to further provide new, interesting and difficult learning materials that are related to the children's life and allow personal involvement.

While we cannot turn to the fledging results of brain research to prescribe specific policies, we can use an understanding of brain dominance to gain an appreciation of individual variance in learning style (Ranpura, 1999). When gifted pupils are empowered with self-knowledge with regard to brain dominance, it is hoped that they will learn to become more effective learners and gradually learn to discover and unfold the intricacies and mysteries in the universe.

The true *self* would probably emerge after the complex, demanding and life-long process of self-discovery (Palmer, 1998, p. 13). A lack of self-knowledge education on basic human faculties like the cognitive functions in this study and their development would surely hinder the development of these human capacities in students, and gifted pupils in this study—intellectually, morally, physically, emotionally and socially.

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