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Learning and Teaching through the Multiple-Intelligences Perspective: Implications for Curriculum Reform in Hong Kong

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Gardner's theory of multiple intelligences and the multiple-intelligences perspective on learning, teaching, curriculum, and assessment are briefly described. Integral to this perspective are learning through engaging the full spectrum of student intelligences, teaching through multiple intelligences to emphasize enhanced understanding, employing multiple curricular options to foster learning to learn, and assessing through multiple intelligences to inform performance of understanding and further instruction. It is suggested that parallels drawn between this multiple-intelligences perspective and the current Hong Kong curriculum reform proposals may open up new vistas for achieving lifelong learning and all-round development in students.

Key words: multiple intelligences; curriculum reform; Hong Kong

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The widespread recognition of enduring problems in the Hong Kong education system by educators and practitioners in education has propelled Hong Kong into incessant waves of education reform (Chan, 2000). Recent reform measures formulated by the Education Commission (2000) are intended to meet the challenges posed by the knowledge-based and global economy of the present era, and to tackle some of the perennial problems through making available more time and space for teachers and students in schools, offering all-round and balanced learning opportunities, and laying the foundation for lifelong learning. It is evident that these notions are not innovative, as lifelong learning corresponds precisely to the Chinese saying of "*Huo dao lao, xue dao lao,*" and all-round development of students is defined to be in line with development in five domains of ethics, intellect, physique, social skills, and esthetics, domains known to the Chinese as *de, zhi, ti, qun,* and *mei.*

The New Wave of Curriculum Reform in Hong Kong

To achieve lifelong learning and all-round development in students, the Curriculum Development Council (2000), after reviewing the Hong Kong school curriculum, proposes in a consultation document entitled *Learning to Learn* that corresponding curriculum reform needs to be focused on helping students to become autonomous learners, "to build up their capabilities to learn independently,... to become self-reflective on how they learn, and to be able to use different ways of learning" (p. 3). In learning to learn, as specified in the consultation document, students will be provided with five learning experiences in and outside regular classrooms throughout all stages of schooling. These five learning experiences are in the areas of moral and civic education, intellectual development, community service, physical and esthetic development, and career-related experiences, corresponding in general to the development of *de, zhi, ti, qun,* and *mei.* To ensure the provisions of these five learning experiences, a reformed three-component curriculum framework is proposed to encompass the teaching and learning of

knowledge and concepts, skills, and values and attitudes. More specifically, a set of core and sustainable values and attitudes, as one of the three components, is suggested for incorporation in the teaching and learning of knowledge and skills at different stages of schooling. Also cutting across different knowledge areas is the component of generic skills, which are regarded as fundamental in helping students to learn how to learn. The nine generic skills are collaboration skills, communication skills, creativity, critical thinking skills, information technology skills, numeracy skills, problem solving skills, self-management skills, and study skills. Finally, the teachable knowledge domains or content subjects, with specific considerations of the Hong Kong context, are organized into eight key learning areas: Chinese Language Education; English Language Education; Mathematics Education; Personal, Social, Humanities Education; Science Education; Technology Education; Arts Education; and Physical Education. Thus, the belief that "all students could learn, and that they have different intelligences" (Curriculum Development Council, 2000, p. 1) has led to the articulation of eight key learning areas, nine generic skills, and a set of values and attitudes, which are considered worth learning within the reformed curriculum framework.

However, despite that the reformed curriculum is intended to be learner-centered, the proposed framework tends to emphasize the teaching or instructional perspective. While it is recognized that learners should not be treated the same way, nor should they study the same subjects in the same way and be assessed in the same way, the assessment of individual learning needs, strengths and weaknesses, and learning strategies of students have not been appropriately accommodated in the framework for effective learning and teaching. The dissociation between learning and teaching as well as between assessment and curriculum is at variance with the commitment to individual differences and the spirit of learning to learn in the reformed curriculum. In this regard, the conceptualization of teaching and learning from the multiple-intelligences perspective may serve to inspire how appropriate links can be fostered among teaching, learning, curriculum, and

assessment in this new wave of curriculum reform in Hong Kong. For an appreciation of implications of the multiple-intelligences perspective, a brief description of Gardner's theory of multiple intelligences is in order.

Gardner's Theory of Multiple Intelligences

Gardner (1983, 1993) challenged the notion that intelligence is a unitary general ability that cuts across all domains of competence, and he brought to life a theory that proposes that there are multiple intelligences. Specifically, Gardner (1983) redefined the construct of intelligence to encompass the ability to solve problems or to create products that are valued within one or more cultural settings, highlighting that intelligence cannot be considered apart from the uses to which it is put and the values of the cultural contexts. More recently, Gardner (1999) further refined the definition to conceptualize intelligence as "a biopsychological 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" (pp. 33-34), suggesting that intelligences are potentials to be activated, depending on cultural values, opportunities in the culture, and personal decisions.

To determine whether or not a particular human capacity qualifies as an intelligence, Gardner (1983, 1993) established eight criteria for an intelligence to be identified. The criteria he considered are evidenced by (1) the potential isolation of an intellectual competence by brain damage; (2) the presence of highly uneven profiles of abilities of idiot savants, prodigies, and autistic children; (3) the existence of one or more basic information-processing mechanisms or core operations on various kinds of input, such as the syntactic, semantic, and pragmatic capacities in language, or the rhythmic and pitch abilities in music; (4) the existence of a distinctive developmental history linked to an identifiable set of expert performances; (5) the plausibility of an evolutionary history; (6) the support from experimental tasks showing the difficulty of establishing transfer of learning across tasks; (7) the support from psychometric findings on the high correlation among

tasks designed to assess one type of ability; and (8) the susceptibility to encoding in a symbol system such as language, mathematics, and picturing.

On the basis of these criteria, Gardner (1983) initially identified seven intelligences that all individuals possess to varying degrees, and these intelligences might be combined and used in highly personal ways. In considering additional candidate intelligences, including naturalist, spiritual, existential, and moral ones, Gardner (1999) added naturalist intelligence as an eighth intelligence. These eight intelligences can be defined and summarized as follows.

(1) Verbal-linguistic intelligence relates to words and language, and is used in listening, speaking, reading, and writing.

(2) Logical-mathematical intelligence deals with deductive and inductive reasoning, numbers and relationships. It involves the ability to recognize patterns, to work with geometric shapes, and to connect different pieces of information.

(3) Visual-spatial intelligence includes being able to visualize an object and to create mental images. It deals with the visual arts, navigation, architecture, and certain games such as chess.

(4) Bodily-kinesthetic intelligence is related to physical movement, the knowledge of the body and its functions. It includes the ability to use the body to express emotions, to play a game, and to interpret and invoke effective body language.

(5) Musical intelligence includes the ability to recognize tonal patterns, pitch, rhythm, and timbre. It includes the sensitivity to environmental sounds, the human voice and musical instruments.

(6) Interpersonal intelligence is used in person-to-person relationships. It includes the ability to communicate with others, to have empathy for their feelings and beliefs, to work with and relate to others, and to understand their moods, temperaments, motivations, and intentions.

(7) Intrapersonal intelligence is based on the knowledge on the self, one's strengths, weaknesses, hopes, and desires. It includes metacognition, emotional responses, self-reflection and an awareness of metaphysical concepts.

(8) Naturalist intelligence consists of observing patterns in nature, identifying and classifying objects, and understanding natural and human-made systems.

Gardner's theory of multiple intelligences appeals not only to psychologists, but also to educators who seek to apply it to educational practices (e.g., Armstrong, 1994a, 1994b; Blythe & Gardner, 1990; Campbell, 1991; Gardner & Hatch, 1989; Hoerr, 1994; Lazear, 1994, 2000). In view of the full range of intellectual and cognitive abilities, it is believed that traditional education programs emphasize engaging students' linguistic and mathematical intelligences and minimize the importance of other forms of knowing. Thus, students who fail to demonstrate traditional academic intelligences may have other potential and strengths that remain unrealized in the context of a biased curriculum and as a result of a corresponding system of biased assessment.

Educational Implications from the Multiple-Intelligences Perspective

Since the publication of the theory of multiple intelligences (Gardner, 1983), many educators in North America have attempted to synthesize and develop the theory in terms of curriculum development (e.g., Armstrong, 1994a, 1994b; Campbell, Campbell, & Dickinson, 1999; Lazear, 1994, 2000). Based on the theory, reform initiatives have also emerged across North America to rectify the biased curriculum that emphasizes verbal and quantitative abilities through restructuring the learning processes, the instructional practices, the curriculum designs and the assessment procedures to include the full spectrum of student abilities.

Restructuring learning and instruction: Learning and teaching through multiple intelligences

The multiple-intelligences perspective conceptualizes enhanced learning in terms of engaging as many of students' multiple intelligences as possible in

learning. Thus, in addition to reading, writing, computing, and listening, students may learn through images, textures, rhythm, color, movement, sculpting, painting, designing, singing, model making, and role playing. However, students who are capable of engaging their multiple intelligences as areas of strength in learning need to recognize their own strengths and weaknesses, be able to consciously use the various cognitive capacities, and be able to use these capacities intentionally to improve problem-solving ability and to enhance creativity. Thus, students need to be taught about multiple intelligences so they recognize their strong and less developed intelligences, and about how they might develop the individual intelligences and use different ways of knowing in their formal schooling and daily living. Armstrong (1999), for example, has endeavored to make the terms for each of the intelligences user-friendly for young students, allowing them to become intelligent in more than one way, as word smart, logic smart, picture smart, body smart, music smart, people smart, self smart, and nature smart. While most students can develop each intelligence to an adequate level of competence, all students are encouraged to use the full spectrum of their intelligences regularly to acquire knowledge and to process information, as well as to deepen, amplify, and enhance their understanding of important questions, topics, and themes.

Given that each student has a unique profile of strengths or multiple intelligences, teachers should consider using different pedagogical approaches through multiple intelligences to provide students with more opportunities to learn thorough their strengths so that more students can be reached in more effective ways. Campbell, Campbell, and Dickinson (1999), for example, suggested that four intelligences serve well as windows into any content area. Efforts in teaching through four intelligences will provide students with four opportunities to access information while challenging teachers to work in new ways. Since restricting themselves to their own most comfortable and accustomed ways of teaching may block some students from learning through students' strengths, teachers may also want to identify their frequently overlooked intelligences and integrate them into

lesson designs to better engage the full spectrum of student learning strengths. Apart from using intelligence-specific exercises, games, puzzles, and activities to help students use various modalities of knowing, teachers should also employ various media and technological tools for stimulating the different intelligences of students in the classroom.

Teaching through multiple intelligences allows teachers to teach for greater and enhanced understanding on important topics and themes for students. Gardner (1999) proposes three increasingly focused approaches to teaching for understanding: (1) entry points, (2) analogies, and (3) approaching the core. An entry point serves to put students directly at the center of a topic, arousing their interests for further exploration. Gardner (1999) further suggests seven discrete entry points that can be aligned with seven intelligences. The narrational entry point addresses students who enjoy learning about topics through stories. The quantitative/numerical entry point speaks to students who are intrigued by numbers and the patterns they make, the various operations that can be performed, and insights into size, ratio, and change. The logical entry point encourages students to think deductively in terms of, for example, syllogisms. The foundational/existential entry point appeals to students who are attracted to fundamental kinds of questions. The esthetic entry point inspires students by works of art or by materials arranged in ways that feature balance, harmony, and composition. The hands-on entry point allows students to approach a topic through an activity in which they become fully engaged in building something, manipulating materials, or carrying out experiments. The social entry point employs a group setting where students can assume different roles, observe others' perspectives, interact regularly, and complement one another.

Beyond the entry point, the teacher may use analogies or metaphors, drawn from materials students already understand, that can convey important and revealing aspects of the less familiar topic. Since each analogy may suggest parallels that do not hold, the teacher should also point out the appropriate and misleading parts of the analogy to avoid distorting the un-

derstanding of students. While apt analogies may convey revealing parts of the concept in question, enhanced understanding can be approached by providing explicit instructions and assessing understanding in terms of linguistic mastery of materials, by supplying students with adequate information for their syntheses, or by using pivotal examples that have proved to be effective. Thus, teaching for understanding requires spending significant time on a topic, portraying the topic in a number of ways to illustrate its intricacies, determining which intelligences, which analogies, and which examples are most likely to capture important aspects of the topic, and calling on a range of intelligences, skills, and interests to reach various students.

Restructuring curriculum designs: Developing curriculum through multiple intelligences

In the multiple-intelligences perspective, any curriculum model can be scrutinized to see if it includes the full range of human capacities. Educators therefore should write curriculum guides in ways that value the development of the full range of intellectual capabilities. In restructuring lesson planning, for example, teachers might reflect on a concept they want to teach and identify the intelligences that seem most appropriate for communicating the specific content area. Teachers might also seek inputs from students about ways they most like to learn. Lesson planning through multiple intelligences allows teachers to infuse or integrate as much as possible the various intelligences into the design of curriculum units so that students have ample opportunities to use these intelligences to gain knowledge, process information, and deepen their understanding. Similar planning and use in homework might help challenge all students to address their weaknesses and to enjoy working through their strengths. On the other hand, teachers may expand the physical education and fine arts in the curriculum (including music, art, dance, drama, poetry, storytelling, and creative writing) and incorporate them into the traditional academic areas to help all students develop the full spectrum of their intelligences. These dimensions of the curriculum should not be optional nor should they be viewed as extracurricular.

Specifically, the multiple-intelligences perspective suggests diverse curricular models. At the primary school level, learning centers can easily feature the eight intelligences, and the curriculum is thematically organized through the learning centers. Interdisciplinary curriculum with theme-based teaching often integrates the eight intelligences, as discrete subject matter distinctions begin to dissolve, and languages, mathematics, nature studies, music, fine arts, physical education as well as both cooperative and independent work can be woven into the teaching of any topic. In line with embracing interdisciplinary instruction, team teaching enables teachers to work from their areas of strength. However, rather than teaming based on content areas, "intelligence teams" in which each teacher member of the team identifies his or her intelligence expertise can be formed to assume responsibility for specific intelligences in lesson planning or daily instruction. Whether working with theme-based or traditional curricula, teachers in "intelligence teams" serve as resources for one another.

At the secondary school level, teachers may co-plan multiple-intelligences-based lessons while maintaining responsibility of their self-contained classrooms. Knowing what their colleagues will teach throughout the school year, teachers may align topics that are mutually supportive and plan to teach such topics concurrently. Lessons including as many of the eight intelligences not only provide greater depth in content, but they also require more time to teach.

Consistent with theme-based and interdisciplinary instruction are project-based curriculum and the use of mentorship or apprenticeship. Classroom projects may be employed to develop content and process understanding in students, as productive human work often occurs in the form of meaningful and complex projects (Wolk, 1994). In addition, a project generally poses multiple solutions and often helps connect schooling with real life. In community service programs, school trips, or laboratory experiments, it has been found that projects invariably involve students in efforts that are personally relevant and have value for others. The use of mentorship or apprenticeship is another curricular option. Mentorship or apprenticeship of-

fers students opportunities to work with adults who are practitioners and experts in their own disciplines or crafts, and teaches students that understanding and mastery of real-world, culturally valued skills have to be gained gradually through effort and discipline over time.

Restructuring assessment: Assessing through multiple intelligences

In the multiple-intelligences perspective, conventional tests or assessment instruments do not appropriately or adequately assess multisensory instruction, interdisciplinary units, theme-based teaching, project-based learning, and mentorships or apprenticeships (Chen & Gardner, 1997). Students should therefore be assessed in the classroom environment with engaging materials, exercises and games on both academic and real-world skills. They should be evaluated multimodally so they can demonstrate what they know through multiple intelligences and in numerous ways. At the same time, information about students' growth and development should be gathered over time through formal and informal means such as score sheets, observation checklists, portfolios, and tape-recordings, and should emphasize areas of strength. Students should also acquire autonomous learning skills and learn how to actively self-assess.

Whereas assessment is most frequently used to provide information about student understanding and performance, it also informs instruction and indicates the quality of instruction. Based on assessment results, teachers might find it necessary to re-teach through multiple intelligences to enhance and deepen understanding of specific content areas. Viewed in this manner, assessment is an integral part of the regular teaching and learning process. Students' multiple-intelligences profiles provide a whole picture of the various factors (strengths and weaknesses, likes and dislikes) that are part of the intellectual functioning and capabilities of students. These student profiles may be used as the basis for designing individualized, developmentally appropriate learning plans and capacity-development opportunities that fully utilize students' strengths to work on developing capacity in their strong as well as weak areas.

Implications for the Hong Kong Curriculum Reform

The recent review of school curriculum and proposed curriculum reform are conducted in parallel with the review of the education system by the Education Commission (2000), which proposes, as overall aims of education, the achievement of all-round development and life-long learning in students. The Hong Kong school curriculum is widely recognized to be overcrowded, rigid, and prescriptive, giving little room for creative and critical thinking. In addition, it is characterized by a collection of somewhat overlapping and outdated school subjects and examination syllabuses produced by many government-appointed subject committees that are not well coordinated (Curriculum Development Council, 2000). Any curricular changes are often necessitated by changes in examination subjects at senior secondary level. However, more recent innovative efforts, such as the activity approach, remedial teaching, resource classes, the target oriented curriculum, mastery learning and subject integration, are reform attempts consistent with the notion of student-centered learning. Despite these fragmented measures, the Hong Kong school curriculum is still a far cry from achieving the overall aims of education as endorsed by the Education Commission (2000).

While one might conjecture that the multiple-intelligences-based notions of restructuring curriculum designs would be most relevant and bear directly on the curriculum reform in Hong Kong, it should be noted that learning, teaching, curriculum and assessment are interrelated and integral parts of the multiple-intelligences perspective. The connections among learning, teaching, curriculum, and assessment within the multiple-intelligences framework are exemplary for conceptualizing the links among the five learning experiences, the eight key learning areas, the nine generic skills, and the set of values and attitudes in this new wave of Hong Kong curriculum reform.

Nonetheless, aiming at achieving the ultimate desirable outcome of learning to learn in this wave of curriculum reform, certain questions related to this and possibly any school curriculum still need to be addressed. These questions include: What are the truly essential knowledge contents

or concepts students should acquire? What should be omitted from the curriculum, and what should be retained or added? Why teach certain topics? What will students retain? How can student choice be worked into the classroom? Curricular changes may come about, based on the required learning experiences and the three-components of key learning areas, generic skills, and values and attitudes, addressing what to keep, what to change, and what connections might be made among subject areas. Irrespective of the final changes, the importance of student understanding of essential curriculum should be emphasized. Insuring that students truly understand essential academic content areas so that they can apply their knowledge in new situations is implicit in the educational goal of learning to learn. Perhaps, the difficulty in achieving this educational goal is reflected in the voluminous yet separate consultation documents on the key learning areas.

While analogies and parallels can be readily drawn between the multiple-intelligences perspective and the current proposed curriculum reform, the multiple-intelligences perspective has merits in its relative simplicity in emphasizing the unique cognitive profile of intelligences of individual student for learning, teaching, curriculum and assessment. The multiple-intelligences perspective suggests what should be taught and why, reducing the pressure for coverage, yet stressing the importance of teaching for understanding. The essential curriculum should provide the basis for enhanced understanding of the physical world, the biological world, the world of human beings, the world of human artifacts, and the world of the self (Gardner, 1999). The acquisition of literacy, the learning of basic facts, the cultivation of basic skills, and the mastery of the ways of thinking of the disciplines should be regarded as tools that allow students to enhance their understanding of important questions, topics, and themes. On this basis, it makes good sense to teach fewer topics, and to treat them in greater depth through multiple representations and multiple intelligences. For example, curriculum materials should be related to selected central themes, such as evolution in biology, the rape of Nanking in history, energy in physics, or character in literature, and topics that cannot be reasonably connected to

powerful themes should be eliminated. Having determined which topics require sustained attention, teachers may choose different curricular options in, for example, team-teaching or project-based learning. Teachers may also employ different pedagogical approaches, choosing entry points that attract the interest and attention of diverse students, and examples, analogies, or metaphors that convey important parts of the topic in clear and powerful ways. In this way, students benefit from the opportunity to view a topic or theme through numerous perspectives while experiencing connections among their formerly separate subject areas. Finally, since each student may have a different profile of strengths and weaknesses or intelligences, it is worth considering whether pivotal curricular materials can be taught and assessed in a variety of ways, and both baseline assessment and assessment on performance reflecting understanding invariably inform further instruction. Thus, learning, teaching, and assessment through multiple intelligences provide insights into this new wave of curriculum reform in Hong Kong. The extent to which the multiple-intelligences perspective may inspire the present exercise of curriculum reform to achieve all-round development of autonomous learners who are also capable of lifelong learning remains a topic of great interest in future educational research.

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