

【Education Policy Studies Series】

Promoting Critical Thinking:
Discussing the Capacity of Issue-
Inquiry Approach in Liberal Studies

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Education Policy Studies Series

Education embraces aspirations of individuals and society. It is a means of strengthening human resources, sustaining competitiveness of society, enhancing mobility of the underprivileged, and assimilating newcomers to the mainstream of society. It is also a means of creating a free, prosperous, and harmonious environment for the populace.

Education is an endeavor that has far-reaching influences, for it embodies development and justness. Its development needs enormous support from society as well as the guidance of policies that serve the imperatives of economic development and social justice. Policy-makers in education, as those in other public sectors, can neither rely on their own visions nor depend on the simple tabulation of financial cost and benefit to arrive at decisions that will affect the pursuit of the common good. Democratization warrants public discourse on vital matters that affect all of us. Democratization also dictates transparency in the policy-making process. Administrative orders disguised as policies have a very small audience indeed. The public expects well-informed policy decisions, which are based on in-depth analyses and careful deliberation. Like the policy-makers, the public and professionals in education require a wealth of easily accessible facts and views so that they can contribute constructively to the public discourse.

To facilitate rational discourse on important educational matters, the Hong Kong Institute of Educational Research of The Chinese University of Hong Kong organizes from time to time “Education Policy Seminars” to address critical issues in educational development of Hong Kong and other Chinese societies. These academic gatherings have been attended by

stakeholders, practitioners, researchers and parents. The bulk of this series of occasional papers are the fruit of labor of some of the speakers at the seminars. Others are written specifically as contributions to the series.

The aim of this *Education Policy Studies Series* is to present the views of selected persons who have new ideas to share and to engage all stakeholders in education in an on-going discussion on educational matters that will shape the future of our society.

Promoting Critical Thinking: Discussing the Capacity of Issue-Inquiry Approach in Liberal Studies

Abstract

The New Senior Secondary Curriculum (NSSC) of Liberal Studies has been launched since the academic year of 2009. As a core subject to promote generic skills, Liberal Studies is regarded as an interdisciplinary subject that nurtures critical thinking through issue-inquiry learning approach as one of its learning objectives. In order to explore the capacity of issue-inquiry approach in Liberal Studies to promote critical thinking, this paper discusses such an issue in three parts. First, it introduces the nature of critical thinking and the four habits of mind for critical thinking. Second, the relationship between issue-inquiry learning approach and issue-inquiry learning in Liberal Studies is discussed with the four habits of mind for critical thinking. Finally, this paper reveals some of the problems in the NSSC of Liberal Studies and concludes with recommendations. It is found that although the issue-inquiry learning approach in the NSSC of Liberal Studies includes all the four core habits of mind for critical thinking, there are still rooms for improvement for Liberal Studies to become a more comprehensive curriculum for critical thinking.

Introduction

Nurturing critical thinking has been one of the educational objectives in many countries and cities (e.g., the United States, Canada, Australia, New Zealand, the United Kingdom, China,

and Taiwan). In Hong Kong, it has been treated as a significant topic in the education as well. Although it has been one of the learning objectives in various school subjects in Hong Kong since the 1990s, both of the 1998/99 and 2000/01 annual reports of the Education Bureau (EDB) revealed that secondary students lacked appropriate learning activities to develop their critical thinking skills (EDB, 2007a, 2007b). In order to re-emphasize the importance of critical thinking in the curriculum, in the core education reform document of *Learning to Learn: The Way Forward in Curriculum Development*, critical thinking was declared as one of the generic skills that need to be fostered under the 21st century education reform (Curriculum Development Council [CDC], 2001, p. vi). In the document, it was clearly stated that generic skills are one of the components of the curriculum framework that helps students learn how to learn.

In line with the education reform, the consultation document of the New Senior Secondary Curriculum (NSSC) of Liberal Studies was released in 2004. One year later, Liberal Studies was announced to be one of the core subjects in the “3+3+4” education system. Since then, there were a flood of discussions among educators on the issues like the subject nature, the administrative arrangement, the professional development among teachers, the learning approach, the assessment, the connection with the higher education system, and the recognition by the employers (e.g., Chiu & Mak, 2006; Deng, 2009; Fok, 2007; Kwok, 2007; Lam & Zhang, 2005; Rong, 2005; Tsang, 2006; Wong & Wong, 2007). Nonetheless, the promotion of critical thinking in Liberal Studies using the issue-inquiry

learning approach has not been fully explored. To reveal the feasibility to advance critical thinking in Liberal Studies, this paper is composed of three parts: the nature of critical thinking with the list of habits of mind for critical thinking, the issue-inquiry learning approach of Liberal Studies, and finally the exploration of the learning approach used in Liberal Studies with the four habits of mind for critical thinking.

Definition of Critical Thinking

Critical thinking has been a popular study topic in the fields of philosophy, psychology, and education. Many scholars tried to make a final definitions of critical thinking by synthesizing different definitions proposed by significant scholars (Abrami et al., 2008; Carrithers & Bean, 2008; Mazer, Hunt, & Kuznekoff, 2007; McGregor, 2007; Renaud & Murray, 2008). Dewey, one of the most influential educators, first used the concept of reflective thinking to describe critical thinking in 1910. He considered critical thinking as “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends” (Dewey, 1910, p. 6). Glaser (1985) expanded on Dewey’s (1910) perspective by illustrating it as “intelligent judgments on public issues and thus contribute democratically to the solution of social problems” (p. 27). Ennis (1985), an authoritative scholar in critical thinking, echoed with Dewey’s (1910) and Glaser’s (1985) definitions by delineating critical thinking as “reasonable reflective thinking focused on deciding what to believe or do” (p. 14). A few years later, Halpern (2003) captured the essence of critical thinking as “the use of those cognitive skills or

strategies that increase the probability of a desirable outcome. It is used to describe thinking that is purposeful, reasoned, and goal directed — the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions, when the thinker is using skills that are thoughtful and effective for the particular context and type of thinking task” (p. 6).

Although many scholars regarded critical thinking as the application of logic or cognitive thinking skills, others had different points of view about critical thinking. Lipman (2003) treated critical thinking as reliable thinking which “both employs criteria and can be assessed by appeal to criteria.” In one sense, critical thinking “facilitates judgment because it relies on criteria.” In another sense, critical thinking “is self-correcting and sensitive to context” (p. 212). Another notable scholar, Fisher (2005), extended the meaning of critical thinking to “a readiness to reason, a willingness to challenge and a desire for truth” (p. 80). Paul, Binker, and Willson (1993) further elaborated the meaning of critical thinking as “disciplined and self-directed thinking which exemplifies the perfections of thinking appropriate to a particular mode or domain of thinking” (p. 137). Facione (2006), another important scholar of critical thinking in recent years, defined critical thinking as “the process of purposeful, self-regulation judgment. This process reasoned consideration to evidence, context, conceptualizations, methods, and criteria” (p. 17).

From the researcher’s viewpoint, critical thinking is a self-examination process of the gap between the mind and the outside world. Critical thinkers make judgments and decisions on what

to believe or do by inspecting what is perceived. The author's standpoint was supported by Dewey (1910), Ennis (1985), and Glaser (1985). They claimed that critical conclusions, decisions or judgments should be based on careful consideration of supportive reasons. In other words, it is undoubtedly that making judgments or decisions are core to critical thinking. Critical thinkers compare the old concept in mind with the newly received information from the outside world in order to make a reasonable and believable judgment. However, critical thinking is much more than such kind of judgment or decision making. If critical thinkers only rely on the comparison between old concepts and new concepts in mind, the decision might be unreliable because one might retain outdated or even misconceived perception that leads to fault judgments.

To supplement their definitions, a set of criteria for a well-reasoned and rational judgment should be added into the examining process. For example, Paul and Nosich (1992) identified the intellectual standards of critical thinking, namely clearness, accuracy, precision, relevance, depth, breadth, and so on. Furthermore, logic is a crucial criterion used in the reasoning process of critical thinking. In other words, one investigates the correctness of an argument by examining the logic of the conclusion and hypothesis with its premises and provided reasons. This kind of thinking process that applies criteria like the informal logic and monotonic logic in reasoning can also be labeled as disciplined thinking. As a result, Paul et al.'s (1993) and Lipman's (2003) definitions of critical thinking seem agreeable. Above all, critical thinkers should be fair-minded when they examine the evidence for a judgment.

Fair-minded critical thinkers not only consider evidence comprehensively, but also “have knowledge about himself as well as an understanding of others” (Fisher, 2005, p. 78), “disciplined to take into account the interests of diverse persons or groups” (Paul et al., 1993, p. 138), and are “willing to reconsider an opinion” (Facione, 2006, p. 9). In short, critical thinking might be defined as *an examining process which judges and reasons with a set of criteria*.

When compared with the literature meaning of critical thinking, the proposed definition seems agreeable as well. The word *critical* is derived from two Greek words: the first one is *Kritein*, which means “to choose” and “to decide”; and the second one is *Krino*, which signifies “to judge” (Parker, 2009). In addition, the word *critical* is related to the English word *criterion*, which stands for a standard, rule or method. In other words, critical thinkers do not take truth for granted. They make reasonable judgment against certain criteria.

Skills, Dispositions, and Habits of Mind for Critical Thinking

Critical thinking is commonly discussed in three dimensions: skills, dispositions, and habits of mind. For critical thinking skills, it has been a long-lasting topic for study in education since the 1950s. It not only plays a predominant role in the instruction of critical thinking, but also acts as an important indicator of critical thinking. Many notable assessment tools have been developed to measure critical thinking skills, for example, the Watson-Glaser Critical Thinking Appraisal, the Cornell Critical Thinking test, and the California Critical

Thinking Skills Test (CCTST). In addition, critical thinking skills were closely related to the high-order thinking skills in the cognitive objectives of Bloom's taxonomy and generic skills (Ennis, 1962). Although there are different inventories of critical thinking skills, the three inventories proposed by Ennis (1987), Facione (1990), and Scheffer and Rubenfeld (2000) are the most popular. In Appendix 1, the inventories of critical thinking skills proposed by these three scholars are compared.

It was not until the 1980s that the importance of critical thinking dispositions has been recognized (e.g., Ennis, 1981; Nickerson, 1984; Norris, 1985; Siegel, 1980; Sternberg, 1986). In 1995, Facione, Giancarlo, Facione, and Gainen (1995) posed an influential argument about critical thinking. They claimed that people who have good critical thinking skills might not incline to use critical thinking. Their argument was supported by research later (e.g., Colucciello, 1997; Profetto-McGrath, Hesketh, Lang, & Estabrooks, 2003; Ricketts & Rudd, 2004). For example, Ricketts and Rudd (2004) used the CCTST and the California Critical Thinking Dispositions Inventory (CCTDI) to find out the correlation between critical thinking skills and dispositions. In their studies, positive correlation between critical thinking dispositions and critical thinking skills was found. This implied that we could not solely foster "the ability to think but also the disposition to think, to develop patterns of thinking and habits of mind students not only *can* use but that they *do* use ... ability alone is insufficient for good thinking; one also must have the inclination to use that ability along with the awareness of opportunities for its use" (Ritchhart, 2007, p. 138; italics original). Therefore, in addition to critical

thinking skills, critical thinkers should also possess critical thinking dispositions to recognize the necessity of critical thinking skills and apply it. In other words, both critical thinking skills and dispositions are essential to critical thinkers.

In some occasions, when people talk about critical thinking dispositions, they relate them with habits of mind for critical thinking. For instance, Norris (1992) posed that critical thinking disposition is not only a desire or predilection to thinking critically, but also a *habit* to use certain abilities or overtly think and choose to use the abilities they possess. Facione, Giancarlo, et al. (1995) described critical thinking dispositions as a constellation of attitudes, intellectual virtues, character traits, and habits of mind. They even named the seven critical thinking dispositions toward critical thinking as habits of mind for critical thinking (Facione, Facione, & Giancarlo, 1997), while Scheffer and Rubenfeld (2000) used habits of mind for critical thinking to represent critical thinking dispositions in their Nursing Delphi Study. In Appendix 2, the lists of critical thinking dispositions proposed by Ennis (1987), Facione, Giancarlo, et al. (1995), and the inventory of habits of mind for critical thinking by Scheffer and Rubenfeld (2000) are compared.

One may ask: if habits of mind for critical thinking are comparable to critical thinking dispositions, does it mean that they are equivalent or replaceable by each other? Actually, they are different in meaning. For disposition, it means an inclination, tendency, or willingness to behave in a particular way (Longman Online Dictionary, 2009). It is “a tendency to exhibit frequently, consciously, and voluntarily a pattern of

behavior that is directed to a broad goal” (Katz, 1993), which is composed of three endurable psychological elements: sensitivity, inclination, and abilities (Ritchhart & Perkins, 2000). Ennis (1989) regarded critical thinking dispositions as a tendency to do something in a given condition. Facione, Giancarlo, et al. (1995) added that “the disposition toward critical thinking is the consistent internal motivation to engage problems and make decisions by using thinking” (p. 2). For habits of mind, they are the intellectual tendencies or dispositions to act in a particular way (Nciku, 2009). Costa and Kallick (2008) defined a habit of mind as “having a disposition toward behaving intelligently when confronted with problems with dichotomies, dilemmas, enigmas and uncertainties” (p. 30), which is “a composite of many skills, attitudes, cues, past experiences, and proclivities” (Costa, 2008, p. 17) (see Table 1).

Table 1. Dimensions of Habits of Mind

Dimension	Description
Value	<ul style="list-style-type: none"> • Choosing to employ a pattern of intellectual behaviors rather than other, less productive patterns
Inclination	<ul style="list-style-type: none"> • Feeling the tendency to employ a pattern of intellectual behaviors
Sensitivity	<ul style="list-style-type: none"> • Perceiving opportunities for, and appropriateness of, employing the pattern of behaviors
Capability	<ul style="list-style-type: none"> • Possessing the basic skills and capacities to carry through with the behaviors
Commitment	<ul style="list-style-type: none"> • Constantly striving to reflect on and improve performance of the pattern of intellectual behaviors
Policy	<ul style="list-style-type: none"> • Making it a policy to promote and incorporate the patterns of intellectual behaviors into actions, decisions, and resolutions of problematic situations

Source: Costa and Kallick (2008, p. 17).

Siegel (1999) labeled the composition of critical thinking as the “critical spirit” consisting of dispositions, attitudes, habits of mind, and character traits. According to Siegel (1999), disposition is the tendency to seek reasons and evidence for judgments; attitudes is a respect for the importance of reasoned judgment and for truth; habits of mind are the combination of dispositions and attitudes that engage in the fair-minded and non-self-interested consideration of reasoned assessment; character traits include all of the above. Tishman (2000) added that habits of mind were the intelligence expressed as characteristic patterns of intellectual behavior in everyday situations. It is transferable and can be expressed as a *disposition view* of intelligence that goes beyond basic cognitive capacity to include character traits, values, and emotions. Critical thinking is one of its dimensions only. To justify Tishman’s (2000) viewpoint, the inventories of habits of mind for critical thinking proposed by Scheffer and Rubinfeld (2000) and Mid-continent Research for Education and Learning (McREL) (2009) are compared with the lists of sixteen habits of mind proposed by Costa and Kallick (2008) and Sizer (1992, pp. 73–74) in Table 2. It is found that the result is coherent to Tishman’s (2000) viewpoint that the two lists of habits of mind for critical thinking only included some items in the considerably comprehensive list of habits of mind proposed by Costa and Kallick (2008).

In conclusion, the viewpoints of Ritchhart and Perkins (2000), Siegel (1999) and Costa and Kallick (2008) about critical thinking dispositions and habits of mind for critical thinking are agreeable. For critical thinking dispositions, it is

comprised of sensitivity, inclination, and abilities. This means that people with critical thinking dispositions has the tendency toward critical thinking and are able to sense when it is needed and to apply it. However, for habits of mind for critical thinking, it includes four more elements: attitudes, values, commitment, and policy. This implies that people with habits of mind for critical thinking has the obligation to behave in such a way intrinsically and treasure critical thinking in addition. Therefore, fostering habits of mind for critical thinking is more valuable and desirable than fostering critical thinking dispositions. Furthermore, it is also signified by the shift of the study in critical thinking in the last few decades: from skills (e.g., since Watson & Glaser, 1952) to dispositions (e.g., since Ennis, 1987), then to habits of mind (e.g., since Scheffer & Rubinfeld, 2000). Hence, habits of mind are of most importance in the cultivation of critical thinking.

Four Habits of Mind for Critical Thinking

Since critical thinking appeared differently in different occasions like verbal reasoning, argument analysis, hypothesis thinking, decision making, and problem-solving (Halpern, 1998), scholars tried to advocate the general characteristics of critical thinking in the last two decades (e.g., Alfaro-LeFevre, 2004; ATEEC, 2003, as cited in Petress, 2004; Beeken, 1997; Daniel, 2001; Gorman-Gelder, Loder, Pinette, & Gelder, 2004, as cited in Petress, 2004; Facione, 1990; Ferrett, 1997; Kienzler, 2001; Lacey & Pritchett, 2003; Nickerson, 1987; Petress, 2004; SNJourney, 2007; Wade, 1995). By investigating these literature, four core habits of mind for critical thinking (i.e., fair and open-mindedness, truth-seeking, understanding

Table 2. Comparison of Habits of Mind

Habits of mind		Habits of mind (Critical thinking)	
Costa and Kallick (2008)	Sizer (1992)	Scheffer and Rubinfeld (2000)	MeREL (2009)
<p>1. <i>Responding with wonderment and awe</i>: They seek intriguing phenomena. They search for problems to solve for themselves and to submit to others. They delight in making up problems to solve on their own, and they so enjoy the challenge of problem solving that they seek perplexities and puzzles from others. They enjoy figuring things out by themselves, and they continue to learn throughout their lifetimes.</p>	<p>1. <i>Joy</i>: Sensing the wonder and proportion in worthy things and responding to these delights</p>	<p>1. <i>Inquisitiveness</i>: An eagerness to know by seeking knowledge and understanding through observation and thoughtful questioning in order to explore possibilities and alternatives</p>	<p>(No comparable habit of mind)</p>
<p>2. <i>Gathering data through all senses</i>: Intelligent people know that all information gets into the brain through sensory pathways: gustatory, olfactory, tactile, kinesthetic, auditory, and visual. Most linguistic, cultural, and physical learning is derived from the environment by observing or taking it in through the senses. To know a wine it must be drunk; to know a role it must be acted; to know a game it must be played; to know a dance it must be performed; to know a goal it must be envisioned. Those whose sensory pathways are open, alert, and acute absorb more information from the environment than those whose pathways are withered, immune, and oblivious to sensory stimuli.</p>	<p>(No comparable habit of mind)</p>	<p>2. <i>Intellectual integrity</i>: Seek the truth through sincere, honest processes, even if the results are contrary to one's assumptions and beliefs</p>	<p>1. <i>Be clear and seek clarity</i></p>
<p>3. <i>Questioning and posing problems</i>: Effective problem solvers know how to ask questions to fill in the gaps between what they know and what they don't know. Effective questioners are inclined to ask a range of questions. They also pose questions about alternative points of view. Effective questioners pose questions that make causal connections and relationships. Sometimes they pose hypothetical problems characterized by "if..." questions. Inquirers recognize discrepancies and phenomena in their environment, and they probe into their causes.</p>	<p>2. <i>Perspective</i>: Organizing an argument, read or heard or seen, into its various parts, and sorting out the major from the minor matter within it. Separating opinion from fact and appreciating the value of each</p>	<p>(No comparable habit of mind)</p>	<p>(No comparable habit of mind)</p>
<p>4. <i>Thinking and communicating with clarity and precision</i>: Intelligent people strive to communicate accurately in both written and oral form, taking care to use precise language; defining terms; and using correct names, labels, and</p>	<p>(No comparable habit of mind)</p>	<p>(No comparable habit of mind)</p>	<p>(No comparable habit of mind)</p>

analogies. They strive to avoid overgeneralizations, deletions, and distortions. Instead, they support their statements with explanations, comparisons, quantification, and evidence.

<p>5. <i>Striving for accuracy:</i> People who value truthfulness, accuracy, precision, and craftsmanship take time to check over their products. They review the rules by which they are to abide; they review the models and visions they are to follow; and they review the criteria they are to use to confirm that their finished product matches the criteria exactly. To be craftsman like means knowing that one can continually perfect one's craft by working to attain the highest possible standards and by pursuing ongoing learning to bring a laser-like focus of energies to accomplishing a task.</p>	<p>3. <i>Analysis:</i> Pondering each of these arguments in a reflective way, using such logical, mathematical, and artistic tools as may be required to render evidence; knowing the limits as well as the importance of such analysis</p>	<p>2. <i>Be accurate and seek accuracy</i></p>
<p>6. <i>Taking responsible risks:</i> Risk takers seem to have an almost uncontrollable urge to go beyond established limits. They are uneasy about comfort; they live on the edge of their competence. They seem compelled to place themselves in situations in which they do not know what the outcome will be. They accept confusion, uncertainty, and the higher risks of failure as part of the normal process, and they learn to view setbacks as interesting, challenging, and growth producing. However, responsible risk takers do not behave impulsively. Their risks are educated. They draw on past knowledge, are thoughtful about consequences, and have a well-trained sense of what is appropriate. They know that all risks are not worth taking.</p>	<p>4. <i>Humility:</i> Knowing one's right, one's debts, and one's limitations, and those of others; knowing what one knows and what one does not know; being disposed and able to gain the needed knowledge, and having the confidence to do so</p>	<p>3. <i>Confidence:</i> Assurance of one's reasoning abilities</p> <p>(No comparable habit of mind)</p>
<p>7. <i>Managing impulsivity:</i> Effective problem solvers are deliberate; they think before they act. They intentionally establish a vision of a product, an action plan, a goal, or a destination before they begin. They strive to clarify and understand directions; they develop a strategy for approaching a problem; and they withhold immediate value judgments about an idea before they fully understand it. Reflective individuals consider alternatives and consequences of several possible directions before they take action. They decrease their need for trial and error by gathering information, taking time to reflect on an answer before giving it, making sure they understand directions, and listening to alternative points of view.</p>	<p>5. <i>Commitment:</i> Recognizing the need to act when action is called for; stepping forward in response; persisting, patiently, as the situation may require</p>	<p>3. <i>Restrain impulsivity</i></p>

Table 2 (Continued)

Habits of mind		Habits of mind (Critical thinking)	
Costa and Kailick (2008)	Sizer (1992)	Scheffer and Rubenfeld (2000)	McREL (2009)
<p>8. <i>Persisting</i>: Efficacious people stick to a task until it is completed. They don't give up easily. They are able to analyze a problem, and they develop a system, structure, or strategy to attack it. They have a repertoire of alternative strategies for problem solving, and they employ a whole range of these strategies. They collect evidence to indicate that their problem-solving strategy is working, and if one strategy doesn't work, they know how to back up and try another. They recognize when a theory or an idea must be rejected and another employed. They have systematic methods for analyzing a problem, which include knowing how to begin, what steps must be performed, what data must be generated or collected, and what resources are available to assist. Because they are able to sustain a problem-solving process over time, they are comfortable with ambiguous situations.</p>	<p>(No comparable habit of mind)</p>	<p>4. <i>Persistence</i>: Pursuit of a course with determination to overcome obstacles</p>	<p>4. <i>Take a position when the situation warrants it</i></p>
<p>9. <i>Thinking flexibly</i>: Flexible people have the most control. They have the capacity to change their minds as they receive additional data. They engage in multiple and simultaneous outcomes and activities, and they draw upon a repertoire of problem-solving strategies. They also practice style flexibility, knowing when thinking broadly and globally is appropriate and when a situation requires detailed precision. They create and seek novel approaches, and they have a well-developed sense of humor. They envision a range of consequences.</p>	<p>(No comparable habit of mind)</p>	<p>5. <i>Flexibility</i>: Capacity to adapt, accommodate, modify or change thoughts, ideas, and behaviors</p>	<p>(No comparable habit of mind)</p>
<p>10. <i>Thinking interdependently</i>: Working in groups requires the ability to justify ideas and to test the feasibility of solution strategies on others. It also requires developing a willingness and an openness to accept feedback from a critical friend. Through this interaction, the group and the individual continue to grow. The characteristics include: listening, consensus seeking, giving up an idea to work with someone else's, empathy, compassion, group leadership, knowing how to support group efforts, altruism.</p>	<p>(No comparable habit of mind)</p>	<p>6. <i>Open-mindedness</i>: A viewpoint characterized by being receptive to divergent views and sensitive to one's biases</p>	<p>5. <i>Maintain an open mind</i></p>

<p>11. <i>Listening with understanding and empathy</i>: The ability to paraphrase another person's ideas; detect indicators (cues) of feelings or emotional states in oral and body language (empathy); and accurately express another person's concepts, emotions, and problems — all are indicators of listening behavior. People who demonstrate this habit of mind are able to see through the diverse perspectives of others. They gently attend to another person, demonstrating their understanding of and empathy for an idea or a feeling by paraphrasing it accurately, building upon it, clarifying it, or giving an example of it.</p>	<p>6. <i>Communication</i>: Accepting the duty to explain the necessary in ways that are clear and respectful both to those hearing or seeing and to the ideas being communicated; being a good listener</p> <p>7. <i>Empathy</i>: Sensing other reasonable views of a common predicament, respecting all, and honoring the most persuasive among them</p>	<p>6. Respond appropriately to others' feelings and level of knowledge</p>
<p>12. <i>Applying past knowledge to new situations</i>: Intelligent humans learn from experience. When confronted with a new and perplexing problem, they will draw forth experiences from their past. They often can be heard to say: "This reminds me of ..." or "This is just like the time when I" They explain what they are doing now with analogies about or references to their experiences. They call upon their store of knowledge and experience as sources of data to support, theories to explain, or processes to solve each new challenge. They are able to abstract meaning from one experience, carry it forth, and apply it in a novel situation.</p>	<p>7. <i>Contextual perspective</i>: Considerate of the whole situation, including relationships, background and environment, relevant to some happening</p>	<p>(No comparable habit of mind)</p> <p>(No comparable habit of mind)</p>
<p>13. <i>Thinking about thinking (metacognition)</i>: Intelligent people plan for, reflect on, and evaluate the quality of their own thinking skills and strategies. Metacognition means becoming increasingly aware of one's actions and the effect of those actions on others and on the environment; forming internal questions in the search for information and meaning; developing mental maps or plans of action; mentally rehearsing before a performance; monitoring plans as they are employed (being conscious of the need for midcourse correction if the plan is not meeting expectations); reflecting on the completed plan for self-evaluation; and editing mental pictures for improved performance.</p>	<p>8. <i>Reflection</i>: Contemplation upon a subject, especially one's assumptions and thinking for the purposes of deeper understanding and self-evaluation</p>	<p>(No comparable habit of mind)</p> <p>(No comparable habit of mind)</p>

Table 2 (Continued)

Habits of mind		Habits of mind (Critical thinking)	
Costa and Kallick (2008)	Sizer (1992)	Scheffer and Rubenfeld (2000)	McREL (2009)
<p>14. <i>Creating, imagining, innovating</i>: Creative human beings try to conceive solutions to problems differently, examining alternative possibilities from many angles. They tend to project themselves into different roles using analogies, starting with a vision and working backward, and imagining they are the object being considered. Creative people take risks and frequently push the boundaries of their perceived limits. They are intrinsically rather than extrinsically motivated, working on the task because of the aesthetic challenge rather than the material rewards. Creative people are open to criticism. They hold up their products for others to judge, and they seek feedback in an ever-increasing effort to refine their technique. They are uneasy with the status quo. They constantly strive for greater fluency, elaboration, novelty, parsimony, simplicity, craftsmanship, perfection, beauty, harmony, and balance.</p>	<p>8. <i>Imagination</i>: Being disposed to evolve one's own view of a matter, searching for both new and old patterns that serve well one's own and others' current and future purposes</p>	<p>9. <i>Creativity</i>: Intellectual inventiveness used to generate, discover, or restructure ideas; imagine alternatives</p> <p>10. <i>Intuition</i>: Insightful sense of knowing without conscious use of reason</p>	<p>(No comparable habit of mind)</p>
<p>15. <i>Remaining open to continuous learning</i>: Intelligent people are in a continuous learning mode. They are invigorated by the quest of lifelong learning. Their confidence, in combination with their inquisitiveness, allows them to constantly search for new and better ways. People with this habit of mind are always striving for improvement, growing, learning, and modifying and improving themselves. They seize problems, situations, tensions, conflicts, and circumstances as valuable opportunities to learn.</p>	<p>(No comparable habit of mind)</p>	<p>(No comparable habit of mind)</p>	<p>(No comparable habit of mind)</p>
<p>16. <i>Finding humor</i>: People who engage in the mystery of humor have the ability to perceive situations from an original and often interesting vantage point. They tend to initiate humor more often, to place greater value on having a sense of humor, to appreciate and understand others' humor, and to be verbally playful when interacting with others. Having a whimsical frame of mind, they thrive on finding incongruity; perceiving absurdities, ironies, and satire; finding discontinuities; and being able to laugh at situations and themselves.</p>	<p>(No comparable habit of mind)</p>	<p>(No comparable habit of mind)</p>	<p>(No comparable habit of mind)</p>

comprehensively, and judging reasonably) were found (see Appendix 3). In the following sections, the four habits of mind for critical thinking would be discussed one by one.

Fair and Open-mindedness

One of the common habits of mind for critical thinking mentioned by many scholars is “fair and open-mindedness.” It is not only labeled as a habit of mind, commitment, or sensitivity of critical thinking (Bailin, Case, Coombs, & Daniels, 1999), but also an approach to apply critical thinking attitudes in workplace (Jackson, Ignatavicius, & Case, 2006, p. 153), an element of the Critical Thinking Indicators (Alfaro-LeFevre, 2003, pp. 46–47), a component of the Critical Thinking Competence Standards (Paul & Elder, 2006), and a characteristic of critical thinking (Daniel, 2001; Facione, 1990). According to Jackson et al. (2006, p. 153), being fair and open to others’ viewpoints could help people to reconstruct their own views and to reason from others’ ideas in a more accurate way. Critical thinkers with “fair and open-mindedness” welcome and consider different viewpoints honestly, patiently, and empathetically. There are two components in the habit of mind of “fair and open-mindedness”: *fair-mindedness* and *open-mindedness*. According to Paul et al. (1993), *fair-mindedness* is defined as:

willingness and consciousness of the need to treat all viewpoints alike, without reference to one’s own feelings or vested interests, or the feelings or vested interests of one’s friends, community, or nation; implies adherence to intellectual standards without reference to one’s own advantage or the advantage of one’s group. (p. 326)

Strong sense or fair-minded critical thinkers not only treat all viewpoints equally regardless of their personal feelings or interests, but also question and reflect on their own viewpoints, and avoid biases or prejudice consciously (Elder & Paul, 1998; Paul & Elder, 2006).

For *open-mindedness*, it is the willingness to question the assumptions, suspend judgment until more information is gathered, attempt to clarify difficult issues, think in new ways, and review evidence (Halpern, 1997, p. 11; Paul et al., 1993, p. 54). In other words, a critical thinker is an open-minded person, who is flexible in mindset, sensitive to his or her own bias, and willing to tolerate divergent views (Facione, Giancarlo, et al., 1995; Halpern, 1997; Scheffer & Rubenfeld, 2000).

In summary, fair and open-minded critical thinkers are willing to clarify difficult issues, question the assumptions, review evidence, and suspend judgment until more information is gathered. They are keen to reflect on their own point of view in order to avoid biases, prejudice, and being influenced by personal feelings and self and group interests. They welcome and consider different viewpoints equally, honestly, and patiently. They also possess flexible mindsets and are able to think in new ways (Appendix 3).

Truth-Seeking

Similar to “fair and open-mindedness,” many lists of critical thinking dispositions include the trait of “truth-seeking” (Dunn, Halonen, & Smith, 2008, p. 37). For example, Bailin et al.

(1999) regarded it as another habit of mind — commitment or sensitivity of critical thinking (p. 281). It is also an element of the CCTDI, which is a popular assessment tool of critical thinking (Facione & Facione, 1992). Since “truth-seeking” is the “desire for the best knowledge, even if it does not support one’s own beliefs” (Jackson et al., 2006, p. 36), an critical thinker, who is also a truth-seeker, is eager to ask questions; identify relevant sources; search for evidence, facts or knowledge (the truth) in a given context; and gather objective, subjective, historical and current data from all senses (Scheffer & Rubinfeld, 2000, p. 358).

To sum up, critical thinkers, as truth-seekers, desire for the best knowledge, even if it does not support their own beliefs. They are eager to ask questions and search for relevant evidence, facts or knowledge (e.g., objective, subjective, historical and current data, etc.) in a given context from all senses (Appendix 3).

Understanding Comprehensively

Additionally, critical thinkers should develop an in-depth and comprehensive understanding of the information from multiple perspectives (McPeck, 1990, p. 28; Miller & Babcock, 1996, p. 7). Not only could they compare and organize all the information from diverse sources in a concise, coherent and meaningful way, but also interpret and consider all the inferences, relationships, background and environment. From the reverse perspective, they should identify all the problems, misconceptions, fallacies, and ambiguity in context. It was supported by Kuhn’s (1999) research that epistemological

understanding is essential to critical thinking, especially when people make judgment with criteria and evidence (p. 23). It is essential to have a clear picture and in-depth understanding of the issue to be investigated before making any judgment. Therefore, “understanding comprehensively” is an essential habit of mind for critical thinking.

In short, critical thinkers develop an in-depth understanding of an event by considering multiple sources of information; comparing and organizing all the information in a concise, coherent and meaningful way; interpreting and pondering all the inferences, relationships, background and environment; and identifying all the problems, misperceptions, fallacies and ambiguity in context (Appendix 3).

Judging Reasonably

As defined previously, critical thinking is *an examining process which judges and reasons with a set of criteria*; it is closely related to reasoned judgment. For instance, Case (2005) claimed that it is essential to engage in deliberations with the intention to make reasoned judgment in critical thinking. Siegel (1980) denoted that a critical thinker assess claims and make reasoned judgments (p. 8). He used “critical spirit” to describe the habits of mind which seek and evaluate reasons and evidence carefully when making judgments (Siegel, 1991, p. 26). Cassel and Congleton (1993) even equated reasoned judgment with critical thinking (p. 21). Therefore, to “judge reasonably” means to distinguish sheer, unreasonable, and subjective opinions or preference in reasoning and to conclude based on careful thought

and reflection (Paul & Elder, 2002). A critical thinker who “judges reasonably” recognizes the necessity of criteria (rules and procedures) or grounds for judgment (Case, 2005; Jones & Brown, 1991), and is able to apply reasons logically, fairly, rationally and with humility. During the process, a critical thinker finds the logical cause and effect, makes predictions with evidence, draws independent inferences, views situations from another person’s perspective, finds logical strategies to solve problems, and perseveres when facing uncertainty (Davis-Seaver, 2000, pp. 38, 48).

In sum, by using necessary criteria (rules and procedures) and logical strategies, critical thinkers make careful and reflective reasoned judgment by finding the logical cause and effect; drawing independent inferences; making predictions with evidence; viewing situations from other perspectives; applying logical, fair and rational reasons; and distinguishing sheer, unreasonable, and subjective opinions or preferences in their reasoning (Appendix 3).

By comparing the above four habits of mind for critical thinking with four important lists of critical thinking dispositions and habits of mind for critical thinking in Table 3, it is found that the list of the author almost includes all the items in the four lists except creativity and intuition. It was explained by Scheffer and Rubenfeld (2000, p. 357) that these two components were unique to nursing and were not included in others’ inventories of critical thinking such as Facione, Giancarlo, et al.’s (1995) because the nursing experts believed that they are vital in the field of nursing.

Table 3. Comparison of Dispositions and Habits of Mind for Critical Thinking

Habits of mind		Dispositions		Habits of mind	
The list of the author		Ennis (1987)		Scheffer and Rubenfeld (2000)	
1.	<p><i>Fair and open-mindedness:</i> Fair and open-minded critical thinkers are willing to clarify difficult issues, question the assumptions, review evidence, and suspend judgment until more information is gathered. They are keen to reflect on their own point of view in order to avoid biases, prejudice, and being influenced by personal feelings and self and group interests. They welcome and consider different viewpoints equally, honestly, and patiently. They also own flexible mindsets and are able to think in new ways.</p>	<p>1. <i>Be open-minded:</i> Consider seriously other points of view than one's own (dialogical thinking); reason from premises with which one disagrees — without letting the disagreement interfere with one's reasoning (suppositional thinking); withhold judgment when the evidence and reasons are insufficient</p> <p>2. <i>Be sensitive to the feelings, level of knowledge and degree of sophistication of others</i></p> <p>3. <i>Look for alternatives</i></p>	<p>1. <i>Open-mindedness:</i> A viewpoint characterized by being receptive to divergent views and sensitive to one's biases</p> <p>2. <i>Reflection:</i> Contemplation upon a subject, especially one's assumptions and thinking for the purposes of deeper understanding and self-evaluation</p> <p>3. <i>Flexibility:</i> Capacity to adapt, accommodate, modify or change thoughts, ideas, and behaviors</p>	<p>1. <i>Restrain impulsivity</i></p> <p>2. <i>Maintain an open mind</i></p> <p>3. <i>Respond appropriately to others' feelings and level of knowledge</i></p>	McREL (2009)
2.	<p><i>Truth-seeking:</i> Critical thinkers desire for the best knowledge, even if it does not support their own beliefs. They are eager to ask questions and search for relevant evidence, facts, or knowledge (e.g., objective, subjective, historical and current data, etc.) in a given context from all senses.</p>	<p>4. <i>Seek a clear statement of the thesis or question</i></p> <p>5. <i>Try to be well-informed</i></p> <p>6. <i>Seek reasons</i></p> <p>7. <i>Seek as much precision as the subject permits</i></p> <p>8. <i>Use and mention credible sources</i></p>	<p>1. <i>Open-mindedness:</i> Being tolerant of divergent views and sensitive to the possibility of one's own bias</p>	<p>4. <i>Inquisitiveness:</i> An eagerness to know by seeking knowledge and understanding through observation and thoughtful questioning in order to explore possibilities and alternatives</p> <p>5. <i>Intellectual integrity:</i> Seek the truth through sincere, honest processes, even if the results are contrary to one's assumptions and beliefs</p>	(No comparable habit of mind)

<p>3. <i>Understanding comprehensively:</i> Critical thinkers develop an in-depth understanding of an event by considering multiple sources of information; comparing and organizing all the information in a concise, coherent and meaningful way; interpreting and pondering all the inferences, relationships, background and environment; and identifying all the problems, misperceptions, fallacies and ambiguity in context.</p>	<p>9. <i>Try to remain relevant to the main point</i> 10. <i>Keep in mind the original and/or basic concern</i> 11. <i>Take into account the total situation</i></p>	<p>4. <i>Maturity:</i> Approach problems, inquiry, and decision making with a sense that some problems are necessarily ill-structured, some situations admit of more than one plausible option, and many times judgments must be made based on standards, contexts and evidence which preclude certainty</p>	<p>6. <i>Contextual perspective:</i> Considerate of the whole situation, including relationships, background and environment, relevant to some happening</p>
<p>4. <i>Judging reasonably:</i> By using necessary criteria (rules and procedures) and logical strategies, critical thinkers make careful and reflective reasoned judgment by finding the logical cause and effect; drawing independent inferences; making predictions with evidence; viewing situations from other perspectives; applying logical, fair and rational reasons; and distinguishing sheer, unreasonable, and subjective opinions or preferences in their reasoning.</p>	<p>12. <i>Use one's critical thinking abilities</i> 13. <i>Deal in an orderly manner with the parts of a complex whole</i> 14. <i>Take a position (and change a position) when the evidence and reasons are sufficient to do so</i></p>	<p>5. <i>Systematicity:</i> Being organized, orderly, focused, and diligent in inquiry 6. <i>Critical thinking self-confidence:</i> Trust the soundness of one's own reasoned judgments and lead others in the rational resolution of problems 7. <i>Analyticity:</i> Prize the application of reasoning and the use of evidence to resolve problems, anticipate potential conceptual or practical difficulties, and consistently be alert to the need to intervene</p>	<p>7. <i>Confidence:</i> Pursuit of a course with determination to overcome obstacles 8. <i>Persistence:</i> Pursuit of a course with determination to overcome obstacles</p>
<p>(No comparable habit of mind)</p>	<p>(No comparable disposition)</p>	<p>(No comparable disposition)</p>	<p>(No comparable habit of mind)</p>
<p>9. <i>Creativity:</i> Intellectual inventiveness used to generate, discover, or restructure ideas; imagine alternatives</p>	<p>10. <i>Intuition:</i> Insightful sense of knowing without conscious use of reason</p>	<p>9. <i>Creativity:</i> Intellectual inventiveness used to generate, discover, or restructure ideas; imagine alternatives</p>	<p>10. <i>Intuition:</i> Insightful sense of knowing without conscious use of reason</p>

Critical Thinking in the NSSC of Liberal Studies

The NSSC of Liberal Studies is an interdisciplinary subject, which consisted of six modules of study with specific learning themes related to students' lives under three study areas ("Self and Personal Development," "Society and Culture," and "Science, Technology and the Environment"). Since textbooks are not recommended by the EDB, teachers have more flexibility in lesson preparation and resources utilization when they connect the learning content to the contemporary issues under the guidelines of the "question for inquiry" and "explanatory notes" in each theme of study (Appendix 4).

In the three years of study, students are required to conduct an Independent Inquiry Study, which apply and extend what is learned from the three learning areas to the new issue of their inquiry study. On the other hand, critical thinking is regarded as a kind of life-long learning skills, which is embedded in the aims of Liberal Studies (Curriculum Development Council & Hong Kong Examinations and Assessment Authority [CDC & HKEAA], 2007, p. 5). In addition to life-long learning skills, critical thinking is also a component of the high-order thinking skills, generic skills, and independent learning skills (CDC & HKEAA, 2007, pp. 3, 6, 140).

It appears in the *Learning to Learn* consultation document that the generic critical thinking skills is concerning with the judgment of what is believable by questioning and inquiring about the accuracy of given statements (CDC, 2000a, p. 47). It aims at helping students to draw meaning from given data or statements, to generate and evaluate arguments. By comparing

the syllabus of Liberal Studies and the expected achievements across the school curricula, it is found that all the learning outcomes of critical thinking skills for senior secondary students proposed by the CDC (2000a) are embedded in the Liberal Studies curriculum (Table 4). This reveals that students are expected to identify the underlying viewpoints, values and judgments, and to apply critical thinking skills in making decisions and judgments on personal and social issues and problems (CDC & HKEAA, 2007, p. 6).

Issue-inquiry Approach in the NSSC of Liberal Studies

Issue-inquiry approach has been adopted as the learning approach in the NSSC of Liberal Studies. Although issue-inquiry was embedded as one of the learning approaches in subjects like Economics and Public Affairs, Geography, and Science since the 1970s (EDB, 2007b), it was not until 1992 that issue-inquiry approach was fully utilized in the Advanced Supplementary Level (ASL) curriculum of Liberal Studies. In the syllabus of ASL Liberal Studies, it described the learning process of issue-inquiry approach in details. With the guiding questions provided, students are able to search for relevant solutions of a problem and to argue reasonably for and against the possible solutions in the learning process of issue-inquiry. They are encouraged to ask question and conduct research when they look for possible solutions. Furthermore, students learn practical skills when they gather, identify, investigate, and evaluate essential information in the learning process (CDC, 2000b, p. 10). Additionally, students develop the awareness of and commitment to responsible actions through community

Table 4. Critical Thinking Skills in the School Curricula

<p>Descriptors of expected achievements across the school curriculum (CDC, 2000a, p. 49)</p>	<p>Exemplars of implementation in Personal, Social and Humanities Education (CDC, 2000a, p. 49)</p>	<p>The NSSC of Liberal Studies (CDC & HKEAA, 2007)</p>
<p><i>Key Stage Four (Senior Secondary)</i></p>	<p>Learners:</p>	<p>Students will learn to:</p>
<p>Learners will learn to:</p> <ol style="list-style-type: none"> 1. distinguish real and stated issues, false and accurate images, and relevant and irrelevant evidence; 2. recognize and challenge subtle consistencies and inconsistencies, unstated fundamental assumptions, permeating value orientations, and ideologies; 3. distinguish among sophisticated fact, opinion and reasoned judgment; 4. be aware that the selection and deployment of information/facts is affected by personal perspective; 5. draw warranted conclusions, predict and assess probable consequences, and make reasoned judgment in reading, writing, and speech. 	<ol style="list-style-type: none"> 1. identify the personal view or stand of a historian by analyzing the ways historical facts are selected and arranged in his/her writing; 2. evaluate arguments in support of cultural or social bias and challenge the false images portrayed and inconsistencies hidden; 3. challenge the justification for a certain economic policy by exposing its underlying assumptions and value orientations; 4. analyze the different views of individuals and groups on the sustainable use of the local environment and identify personal and group interests, reasoned and objective judgments as well as different value orientations behind the issue; 5. analyze carefully the arguments for or against a social issue and discern the issue at stake. 	<ol style="list-style-type: none"> 1. identify the values underlying different views and judgments on personal and social issues, and apply critical thinking skills, creativity and different perspectives in making decisions and judgments on issues and problems at both personal and social levels (p. 6); 2. critically evaluate information, phenomena and ideas presented in the media, so that they can distinguish between fact and opinion and sense objectivity versus bias (p. 4); 3. acquire a relatively comprehensive understanding of the issues, master related facts, analyse the core of the questions, give balanced considerations to different views and make reasoned judgments (p. 4). <p>These themes embody issues which are important to the students and society, and are appropriate for the stage of development of senior secondary students. These issues are perennial in the sense that they involve different values (e.g. economic development and environmental conservation; individual choice and collective interest). (p. 13)</p>

involvement. Besides, students learn to modify predetermined positions and to respect reasonable, non-consensual and strongly held views in the discussions. Eventually, they learn to reflect and adjust their life situations by making use of collected facts, acquired skills and hold values. At the end, both the learning interest and the intrinsic learning motivation would be enhanced (CDC, 2000b, pp. 10–11).

Promotion of Critical Thinking through Issue-inquiry Approach in the NSSC of Liberal Studies

In the NSSC of Liberal Studies, it has mentioned that the issue-inquiry approach not only helps students to develop with independent learning capacity, but also offers students with the opportunities to see the connection among different themes and disciplines, and to appreciate the complexities and organization of knowledge (CDC & HKEAA, 2007, p. 4). The purpose of applying issue-inquiry approach in Liberal Studies is to provide students with learning experience in interpreting facts and making practical judgments. Additionally, in one of the introductory seminars of the NSSC of Liberal Studies, it was informed that knowledge building, issue-inquiry approach, and critical thinking are the three fundamental building blocks of Liberal Studies (CDC, 2006). These presage that critical thinking plays an important role in the learning of Liberal Studies. Nevertheless, the relationship between issue-inquiry approach and critical thinking has never been discussed in any of the curriculum documents. Therefore, in order to reveal this issue, the issue-inquiry approach in Liberal Studies is discussed with the four habits of mind for critical thinking in the following sub-sections.

Issue-inquiry Approach Promotes “Fair and Open-mindedness”

The first habit of mind for critical thinking is “fair and open-mindedness.” In the inquiry process, open-mindedness supports certain strategic behaviors. With open-mindedness, students freely display sensitivity to problems, explore ideas and values, question one’s beliefs, withstand ambiguity, withhold judgment, detect bias, and act on empirically derived information in the inquiry learning process (Haas & Van Scotter, 1975, p. 79). Moreover, it is unavoidable to interact and exchange ideas among peers in the inquiry community (Lipman, 2003). In an inquiry community, students focus on questioning, accept reasonable criticisms, respect and build on the ideas from *different perspectives* (Duffy & Kirkley, 2004, p. 146; Lipman, 2003).

In order to guarantee fair treatment to both personal and others’ viewpoints, students need *many perspectives* to view the world (Educational Broadcasting Corporation, 2004). On the one hand, they reflect on their own viewpoint to avoid being influenced by personal or group benefits; on the other hand, they make balance and objective decision on opinions from *multiple perspectives* (Haas & Van Scotter, 1975, pp. 76, 80). It was agreed by Paul et al.’s (1993) viewpoint of critical thinking that everyday issues are “multilogical” (pp. 480–481). Since there is no single truth in a “multilogical” problem, people are required to extract themselves from the issue, put side by side the pros and cons, look at a situation from all angles, and examine the *multiple perspectives* from the outside (Moon, 2008, p. 60). In other words, critical thinking means to weigh

against different views about an issue (Moon, 2008, p. 61). Therefore, the habit of mind for critical thinking — “fair and open-mindedness” is treasured in the inquiry process.

In Liberal Studies, “fair and open-mindedness” is appreciated in issue inquiry as well. It was clearly mentioned in the curriculum of Liberal Studies that “present arguments clearly and demonstrate respect for evidence” and “open-mindedness and tolerance towards the views and values held by other people” are two of the learning outcomes (CDC & HKEAA, 2007, p. 6). In addition, one of the curriculum aims of Liberal Studies is to develop students with *multiple perspectives* on contemporary issues in different contexts such as cultural, social, economic, political, and technological contexts (CDC & HKEAA, 2007, p. 5). It is anticipated that students can see the connection among different themes and disciplines by means of issue-inquiry approach (CDC & HKEAA, 2007, p. 4).

In the process of issue inquiry and the development of multiple perspectives (Table 5), students not only develop a broad vision of different viewpoints, values and interests related to an issue, but are also able to appraise and analyze different claims fairly based on relevant facts and phenomena from multiple channels using appropriate tools (CDC & HKEAA, 2007, p. 89). Students can “distinguish between fact and opinion and sense objectivity versus bias” by evaluating information, phenomena and ideas presented in the media critically (CDC & HKEAA, 2007, p. 4). They can also distinguish between “subjective” views and opinions held by different parties and “objective” information and knowledge (CDC & HKEAA,

Table 5. Process of Issue Inquiry and the Development of Multiple Perspectives in the NSSC of Liberal Studies

Processes	Relationship with development of multiple perspectives
[I] Mastering the facts, understanding the phenomena, clarifying the concepts	<ul style="list-style-type: none"> • Different sources of information • Different ways of collecting data • Different interpretations and explanations • Different associations • ...
[II] Understanding the differences and conflicts involved	<ul style="list-style-type: none"> • Different values • Different interests • Different convictions • ...
[III] Reflection, evaluation, judgment, solution, action	<ul style="list-style-type: none"> • Considering all sides of the argument • Weighing the pros and cons • Putting forward reasons and justifications • Taking action, evaluating and accepting consequences • Revising judgment • ...

Source: CDC & HKEAA (2007, p. 90).

2007, p. 90). Since objectivity versus subjectivity and facts versus bias are analyzed from multiple perspectives in the learning process of Liberal Studies, it is concluded that the habit of mind of “fair and open-mindedness” for critical thinking is treasured in the issue-inquiry approach of Liberal Studies.

Issue-inquiry Approach Promotes “Truth-Seeking”

The second habit of mind for critical thinking is “truth-seeking.” In inquiry learning, the term “inquiry” means seeking for truth, information or knowledge by questioning (Educational Broadcasting Corporation, 2004). Davis and Davis (2000) claimed that “learning through inquiry is by questioning”

(p. 86). Besides, students are required to formulate questions, detect misconception and underlying assumptions, seek evidence and reason from multiple perspectives during inquiry process (Lipman, 2003, pp. 167–171). They need to investigate, explore, search, quest, pursuit, and study various sources of information and ideas together in order to increase their understanding of an issue (Kuhlthau, Maniotes, & Caspari, 2007, p. 90). Thus, similar to critical thinking, “truth-seeking” is essential to inquiry learning.

In the curriculum guide of Liberal Studies, it was written that the acquisition of information skills and habits enable students to collect, digest, organize and analyze information independently (CDC & HKEAA, 2007, p. 72). For example, when they conduct library research, interview and survey, they can practice how to select useful information from all forms of sources such as books, magazines, newspapers, reports, statistics, maps, diagrams, charts, mass media, the Internet and so forth. By gathering necessary information, student can practice how to identify, investigate, and evaluate the issues they concern. Besides, since collected information may not present the whole truth of an issue, especially those information from the mass media and the Internet, students might need to question and examine them carefully. On the other hand, students with different learning styles and abilities learn to share the research task and duty in a learning community (CDC & HKEAA, 2007, p. 108). They have the chance to examine the accuracy of an argument and question each other’s viewpoints in their discussion as well (CDC & HKEAA, 2007, p. 103). With such an interaction, students learn more about the history, background,

and incidents of an issue. Above all, they are able to discover the underlying beliefs and assumptions from different perspectives of different parties. In conclusion, the habit of mind of “truth-seeking” for critical thinking is essential to the issue-inquiry approach in Liberal Studies.

Issue-inquiry Approach Promotes “Understanding Comprehensively”

The third habit of mind for critical thinking is “understanding comprehensively.” According to Kuhlthau et al. (2007), the main purpose of inquiry learning is to construct new ideas and deep understanding by synthesizing and assimilating facts (p. 22). The Educational Broadcasting Corporation (2004) also pointed out that the generation and transmission of knowledge are the two crucial elements in inquiry. For proficient inquirers, not only can they see patterns and meanings by retrieving their knowledge and connecting to the new information, but they can also access, transfer, and apply their in-depth knowledge to a variety of situations. Horn (2004) added that a critical thinker reflects critically and understands all the contexts in the process of inquiry (p. 213). Therefore, “understanding comprehensively” is vital for inquiry.

In the curriculum guide of Liberal Studies, “understanding comprehensively” was emphasized. It was one of its rationales for students to “acquire a broad knowledge base, and be able to understand contemporary issues that may affect their daily life at personal, community, national and global levels” (CDC & HKEAA, 2007, p. 3). It was also suggested that more than half of the inquiry process should be focused on the acquisition of

the content knowledge so as to provide students with sufficient understanding of the background, nature, and complexity of the issues explored (CDC & HKEAA, 2007, p. 4). On the other hand, it is one of the design principles to expose students to “perspectives and concepts essential to the understanding of issues of human concern, while at the same time emphasising students’ ability to transfer and apply these perspectives and concepts to the understanding of new issues” (CDC & HKEAA, 2007, p. 9). It was suggested that various learning strategies should be employed in order to develop “a relatively comprehensive understanding of the issues, master related facts, analyse the core of the questions, give balanced considerations to different views and make reasoned judgments” (CDC & HKEAA, 2007, p. 4). Students are also expected to construct their practical knowledge via a dual process of both the development and testing of their understanding of issue (CDC & HKEAA, 2007, p. 89).

In Table 5, it was shown that students should master the facts, understand the phenomena, and clarify the concepts in the first stage of the issue-inquiry process. Afterwards, they would understand the differences and conflicts involved in the second stage of the inquiry process. It was further elaborated in the document that:

As learners gather more information on an issue, fresh conflicts and controversies may appear; as they try to sort out the different conflicts, further information may be needed and new concepts may emerge; and as they reflect on the learning process and evaluate the results of the enquiry, new issues and problems may arise which require the collection and analysis of additional

information. Therefore, at the end of the enquiry process, a learner might have more questions than answers, but would have a richer and deeper understanding of the issues involved. (CDC & HKEAA, 2007, p. 90)

Since the issue-inquiry approach of Liberal Studies highlights the importance of comprehensive understanding as critical thinking does, it is concluded that issue-inquiry approach also involves the habit of mind of “understanding comprehensively” for critical thinking.

Issue-inquiry Approach Promotes “Judging Reasonably”

The final habit of mind for critical thinking is “judging reasonably.” According to Pappas and Tepe (2002), it is important to provide practice and experience of critical thinking by applying knowledge, evaluating various choices, and making judgments to a problem (pp. 94–95). Lee (2004), in agreement with Pappas and Tepe, proposed that the process of inquiry is in line with critical thinking; evidential reasoned judgment is formed in the inquiry process, particularly in the final stage (pp. 11–14). By addressing additional questions, considering alternative points of view, proceeding to logical conclusion, appropriate reasoned judgment relating to an issue could be made.

For issue-inquiry approach of Liberal Studies, it is intended to make practical judgments by taking into account “both the facts and the different interpretations of their practical significance and meaning” (CDC & HKEAA, 2007, p. 89). It

was reminded that criticisms from the negative side solely are not reasoned judgment; a right judgment should be made under the consideration of different perspectives (CDC & HKEAA, 2007, p. 89). This involves the organization of relevant facts, opinions or argument of the issue; the detection of conflicts, values and attitudes; the verification of the completeness and correctness of information; the reference to collected data; the validity to generalize the hypothesis; the evaluation of the limitations and alternatives to different positions; and the decision on possible solutions (CDC, 2000b, p. 13). Additionally, as shown in Table 5, students are required to take action, evaluate and accept consequences and revise judgment after considering all sides of the argument, weighing the pros and cons, and putting forward reasons and justifications in stage III of the issue-inquiry process. In view of the similarities between inquiry learning and critical thinking on the issue of reasoned judgment, it arrives at a conclusion that the habit of mind of “judging reasonably” for critical thinking exists in issue-inquiry approach in Liberal Studies as well.

Concluding Remarks

In the above discussion, it is found that the four habits of mind for critical thinking exist in the issue-inquiry approach of the NSSC of Liberal Studies. Thus, the issue-inquiry approach seems to be beneficial to the cultivation of critical thinking. It is also found that the two core elements of issue-inquiry approach — multiple perspectives and learning communities — may facilitate students to grow with critical mind. With multiple perspectives, students may obtain a comparatively comprehensive understanding about the inquired issue through

truth-seeking. They may also evaluate the pros and cons of each perspective in a controversial issue before reaching a reasonable judgment. Above all, students may develop a fair and open-minded attitude when dealing with value conflict from different perspectives. They may learn to reflect on personal values and be objective to others' opinions seriously even when they are against their own views.

On the other hand, students are required to communicate with their peers in the learning process according to the NSSC of Liberal Studies. They may not only learn to divide the truth-seeking work in the issue-inquiry process, but also contribute their own thought toward the inquired issue. When they share their digestion of the issue in their learning community, all the community members may understand the issue more comprehensively. In addition, they may make use of their life experience and value judgment to give critical comments on the issue. They may also learn to examine different perspectives of an issue together by posing questions and discussing their own opinions within their learning communities. Debate and role play are some of the inquiry activities commonly used for such a purpose. In such a tolerated, fair and open-minded learning atmosphere, students may be able to make collective and reasonable judgment under comprehensive consideration.

In conclusion, issue-inquiry approach of Liberal Studies may promote students' critical thinking by providing opportunities for them to identify the underlying viewpoints and values, and to apply critical thinking skills when making judgments on personal and social issues (CDC & HKEAA, 2007, p. 6).

Discussion

Although the promotion of critical thinking through issue-inquiry approach in the NSSC of Liberal Studies has been discussed with the four habits of mind for critical thinking in the previous section, it may only appear as one of the possible perspectives to nurture critical thinking in Liberal Studies.

In the curriculum guide of the NSSC of Liberal Studies, the term “critical thinking” appears as many as 19 times. For instance, one of the curriculum aims is “to develop in students a range of skills for life-long learning, including critical thinking skills” (CDC & HKEAA, 2007, p. 5); it is also one of the learning outcomes and assessment objectives to “identify the values underlying different views and judgments on personal and social issues, and apply critical thinking skills ... in making decisions and judgments on issues and problems at both personal and social levels” (CDC & HKEAA, 2007, p. 6); it is one of the generic skills to be promoted as well (CDC & HKEAA, 2007, p. 182).

However, the relationship between the curriculum and critical thinking has never been discussed in details. No clear instruction has been provided in the curriculum to demonstrate how critical thinking can be developed and applied in each of the study areas, which kind of strategies can encourage critical thinking, what is the role of teachers in the development of critical thinking, and how the assessment of critical thinking can successfully evaluate the application of critical thinking in Liberal Studies. Hence, the appearance of the four habits of mind for critical thinking in the issue-inquiry learning of Liberal Studies may only be a coincidence.

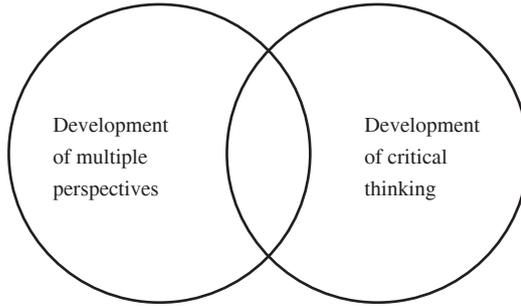
Since critical thinking is one of the generic skills which are expected to be promoted in the 21st century education reform in Hong Kong, other New Senior Secondary curricular that apply issue-inquiry approach to learn may also include the four habits of mind for critical thinking. For example, the Personal, Social and Humanities Education curricula such as Geography, Economics, and History; and the curricula like “Technology and Living” and “Ethics and Religious Studies” are curricula that aim at promoting critical thinking and apply issue-inquiry approach to learn as well. It is predictable that the core elements of critical thinking (four habits of mind) may probably emerge in these curricula. In other words, the four habits of mind for critical thinking may easily be found among the New Senior Secondary curricula which apply issue-inquiry approach to learn. Therefore, the four habits of mind for critical thinking as the evidence may not sufficiently support that the NSSC of Liberal Studies was designed especially for the promotion of critical thinking.

On the other hand, when comparing with other curricula, it seems that not enough guidelines are provided to facilitate the learning of issue-based inquiry in Liberal Studies. For example, in the previous curriculum of Geography, an example of worksheet to demonstrate how issue-based inquiry is adopted in the teaching and learning of Geography (CDC, 2003, pp. 51–57); and in the ASL curriculum of Liberal Studies, the teaching and learning strategies of issue-based inquiry are demonstrated (CDC, 2000b, pp. 36–46). Nonetheless, in the NSSC of Liberal Studies, when discussing issue-inquiry learning, it is solely related to the development of multiple

perspectives. For example, “the processes involved in conducting an issue-enquiry in Liberal Studies, and how these processes are relevant to the development of multiple perspectives” (CDC & HKEAA, 2007, p. 89); and “the development of multiple perspectives throughout the entire issue-enquiry process” (CDC & HKEAA, 2007, p. 90) were written. In such case, it seems that the development of multiple perspectives is more relevant to the investigation of contemporary issues than the development of critical thinking in Liberal Studies.

Above all, the development of multiple perspectives may not intentionally aim at that of critical thinking. It is counted that the term “multiple perspectives” appear for 15 times (4 times less than the term “critical thinking”) in the curriculum of Liberal Studies. It is not only one of its aims “to enable students to develop multiple perspectives on perennial and contemporary issues in different contexts” (CDC & HKEAA, 2007, p. 5), but also one of the assessment objectives of Liberal Studies to “analyse issues ... solve problems, make sound judgments and conclusions and provide suggestions, using multiple perspectives, creativity and appropriate thinking skills” (CDC & HKEAA, 2007, p. 124). It seems reasonable to assess the application of critical thinking by means of multiple perspectives since it helps making the assessment of critical thinking explicit. However, it is doubtful that the development of critical thinking and multiple perspectives appears as two different aims in the NSSC of Liberal Studies. From the researcher’s viewpoint, such inconsistency in the appearance of multiple perspectives and critical thinking in curriculum aims and assessment outcomes seems to be the reason that the

Figure 1. Relation Between the Development of Multiple Perspectives and Critical Thinking



development of multiple perspectives and critical thinking intersect each other (Figure 1).

People who are able to view an issue from different perspectives do not imply that they possess the critical thinking ability and vice versa. Multiple perspectives help students to develop a broader view of an issue so that they understand the issue in a comparably comprehensive way. When people understand an issue more comprehensively, it seems that they are comparably abler to arrive at a reasonable judgment. However, some people who are able to view an issue from different perspectives may not possess critical thinking ability. They may make judgment with fallacies. For example, appeal to authority and appeal to majority are two of the common fallacies people often commit even they possess information from multiple perspectives.

Conversely, multiple perspectives may not be the mere method for reasoned judgment or even critical thinking. Some

scholars even claimed that logic is directly relational to reasoned judgment which is fundamental to critical thinking (e.g., Dewey, 1933; Halpern, 2003; Paul et al., 1993; Walters, 1994). Logic is reasoning by considering the relationships between propositions (Paul et al., 1993, p. 476). With logical thinking, people may probably think critically and make judgment reasonably by deduction or induction. For instance, Dewey (1933) emphasized that:

“logical,” as applied to the process of thinking, signifies that the course of thoughts is carried on *reflectively*, in the sense in which reflection was discriminated from other kinds of thinking. (p. 76; italics original)

Walters (1994) reviewed that:

the explosion of interest in critical thinking that spread across the academy in the last twenty years, focusing squarely and almost exclusively as it does on the canons of logical analysis, operates from an orientation I earlier characterized as logicistic. As a consequence, standard textbooks and courses in critical thinking typically concentrate on exercises and lectures that drill students in the mechanics of logical argumentation ... many institutions use the terms “critical thinking” and “informal/logic” interchangeably in their rosters of course descriptions. As Joanne Kurfiss correctly notes, “teaching ‘critical thinking,’ at least at the introductory level, has become almost synonymous with the methods of applied informal logic”. (pp. 4–5)

Halpern (2003) echoed with these scholars and summarized that:

many definitions of the term *critical thinking* identify reasoning as central to the concept as seen in the definition ... They agreed that "critical thinking is ... cohesive, logical reasoning patterns". (p. 138; italics original)

However, this kind of critical thinking may not involve multiple perspectives in reasoning. Paul et al. (1993) extended that "critical thinking can now be understood as a deep interest in the logic of logic, ... in which we use human reason well or poorly in attempting to make sense of things and our created interpretations of them" (p. 111). In addition, he divided critical thinking into weak sense and strong sense which are monological and multilogical respectively (Paul et al., 1993, pp. 205–206). Since then, the development of multiple perspectives is considered as an important element on top of logic that facilitates the development of critical thinking in Liberal Studies.

In different curricula that apply issue-based inquiry learning to develop critical thinking, the purposes are different. For example, in the previous syllabus of Geography, it emphasized decision making and problem solving (CDC, 2003, p. 50); in ASL curriculum of Liberal Studies, it emphasized problem solving and solution finding (CDC, 2000b, p. 10). It was not until the Certificate Level (CL) of Integrated Humanities that judgment became one of the purposes of issue-based inquiry learning (CDC, 2003, p. 26). For the NSSC of Liberal Studies, it adopted the idea of the CL of Integrated Humanities and continued to regard judgment as one of the purposes of issue-based inquiry (CDC & HKEAA, 2007, p. 4). In fact, judgment is not necessarily related to inquiry learning. They seldom related judgment to inquiry learning (Pappas & Tepe, 2002).

The most common purpose of inquiry learning is problem solving (Jin, 2005, p. 4; Ren, 2005, p. 28). However, decision, solutions and conclusions (made in problem solving) are closely related to judgments. Therefore, critical thinking may appear in different ways when learning via issue-inquiry approaches.

Conclusion and Recommendations

In recent years, the nurturing of critical thinking in liberal education has been emphasized (Gary, 2007, p. 151). As a transformed curriculum from liberal education, the NSSC of Liberal Studies inherits the development of “liberated mind” as its objective (Tsang, 2006, p. 14). Therefore, it is one of its missions to nurture reflective, critical, creative, and advanced “habit of mind.” Like many other liberal education curricula, it is hoped that conceptual analysis, argument clarification, and critical evaluation would eventually become habits through the learning of Liberal Studies. However, the absolutism in methodology and overemphasis on critical thinking strategies led to criticism (Walters, 1986, p. 238). It has been criticized that too much attention was paid to what critical thinking is (knowing) rather than the demand of critical thinking in living (willing) (Gary, 2007, p. 151). Therefore, both the training within the curriculum and the transfer of critical thinking into practice should be treasured.

For the interdisciplinary curriculum of Liberal Studies, it provides a good opportunity for students to apply and transfer critical thinking skills across different contexts and learning situations. With contemporary issues, students are able to resemble the true situations and deal with authentic problems

in personal and social life. After acquiring practical learning experience, it is anticipated that students are able to apply and transfer their learning to real-life situations. Previous research supports that critical thinking skills can be transferred from school context to various settings or real world context successfully if it is taught with appropriate instruction (e.g., Kosonen & Winne, 1995; Lehman & Nisbett, 1990; Nisbett, 1993; Perkins & Grotzer, 1997). Thus, the integration of issue-inquiry approach into the interdisciplinary curriculum of Liberal Studies could probably promote the transfer of critical thinking skills.

On the other hand, despite knowledge, skills, values and attitudes were stressed as the core elements in the NSSC of Liberal Studies, the nurturing of critical thinking is only limited to the skills dimension. The Liberal Studies syllabus only concerned with the content knowledge and its transferability across the three areas of study in the knowledge dimension, while all values and attitudes mentioned are related to the content knowledge as well (Appendix 4). Given these, teachers might easily incline to the teaching of the content knowledge rather than the fostering of critical thinking. Above all, it is believed that skills, dispositions, and habits of mind are essential to critical thinking. Thus, only providing training of critical thinking skills is not enough; students' inclination to apply critical thinking in daily life needs to be enhanced until they develop the required habits of mind.

The determining factor for success in the cultivation of critical thinking in Liberal Studies is the implementation of

issue-inquiry learning approach. Nonetheless, there is no clear guideline on how the learning approach could facilitate the cultivation of critical thinking. Therefore, in order to fill in the gap, it is recommended that practical examples on the teaching and learning strategies of critical thinking and guidelines in the assessment of critical thinking should be provided. Besides, the relationship among critical thinking, issue-inquiry learning, and multiple perspectives should be demonstrated clearly in the NSSC of Liberal Studies.

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Appendix 1: Comparison of Critical Thinking Skills

(Modified from Rubenfeld & Scheffer, 2006, pp. 17–18)

Ennis (1987)	Facione (1990)	Scheffer and Rubenfeld (2000)
<p>1. <i>Asking and answering questions of clarification and challenge</i>: Why? What is your main point? What do you mean by “...”? What would be an example? What would not be an example (though close to being one)? How does that apply to this case (describe a counterexample)? What difference does it make? “...”? What are the facts? Is this what you are saying: “...”? Would you say some more about that?</p>	<p>1. <i>Interpretation</i>: To comprehend and express the meaning or significance of a wide variety of experiences, situations, data, events, judgments, conventions, beliefs, rules, procedures or criteria (Sub-skills: Categorization, Decoding Significance, Clarifying Meaning)</p>	<p>1. <i>Discriminating</i>: Recognizing differences and similarities among things or situations and distinguishing carefully as to category or rank</p>
<p>2. <i>Focusing on a question</i>: Identifying or formulating a question; identifying or formulating criteria for judging possible answers; keeping the situation in mind</p> <p>3. <i>Judging the credibility of a source</i>: Expertise, lack of conflict of interest, agreement among sources, reputation, use of established procedures, known risk to reputation, abilities to give reasons, careful habits</p>	<p>2. <i>Inference</i>: To identify and secure elements needed to draw reasonable conclusions; to form conjectures and hypotheses; to consider relevant information and to deduce the consequences flowing from data, statements, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions, or other forms of representation (Sub-skills: Querying Evidence, Conjecturing Alternatives, Drawing Conclusions)</p>	<p>2. <i>Information seeking</i>: Searching for evidence, facts or knowledge by identifying relevant sources and gathering objective, subjective, historical, and current data from those sources (Comparable to sub-skill: Querying Evidence)</p>
<p>4. <i>Identifying assumptions</i>: Unstated reasons, needed assumptions; argument reconstruction</p> <p>5. <i>Defining terms and judging definitions</i> in three dimensions: Form, definitional strategy, content</p>	<p>(No comparable skill)</p>	<p>(No comparable skill)</p>
<p>6. <i>Deciding on actions</i>: Defining the problem; selecting criteria to judge possible solutions; formulating alternative solutions; tentatively deciding what to do; reviewing, taking into account the total situation; and deciding, monitoring the implementation</p>	<p>(No comparable skill)</p>	<p>3. <i>Predicting</i>: Envisioning a plan and its consequences (Comparable to sub-skill: Conjecturing Alternatives)</p>
<p>(No comparable skill)</p>	<p>(No comparable skill)</p>	<p>4. <i>Transforming knowledge</i>: Changing or converting the condition, nature, form, or function of concepts among contexts</p>

<p>7. <i>Deducing and judging deductions</i>: Class logic, conditional logic, interpretation of statements</p> <p>8. <i>Inducing and judging inductions</i>: Generalizing, inferring explanatory conclusions and hypothesis</p>	<p>3. <i>Explanation</i>: To state the results of one's reasoning; to justify that reasoning in terms of the evidential, conceptual, methodological, criteriological, and contextual considerations upon which one's results were based; and to present one's reasoning in the form of cogent arguments (Sub-skills: Stating Results, Justifying Procedures, Presenting Arguments)</p>	<p>5. <i>Logical reasoning</i>: Drawing inferences or conclusions that are supported in or justified by evidence</p>
<p>9. <i>Analyzing arguments</i>: Identifying conclusions; identifying stated reasons; identifying unstated reasons; seeing similarities and differences; identifying and handling irrelevance; seeing the structure of an argument; summarizing</p>	<p>4. <i>Analysis</i>: To identify the intended and actual inferential relationships among statements, questions, concepts, descriptions or other forms of representation intended to express beliefs, judgments, experiences, reasons, information, or opinions (Sub-skills: Examining Ideas, Identifying Arguments, Analyzing Arguments)</p>	<p>6. <i>Analyzing</i>: Separating or breaking a whole into parts to discover their nature, function, and relationships</p>
<p>10. <i>Observing and judging; observation reports, criteria</i>: Minimal inferring involved, short time interval between observation and report, report by observer rather than someone else (i.e., not hearsay), records are generally desirable; if report is based on a record, it is generally best; corroboration, possibility of corroboration; conditions of good access; competent employment of technology, if technology is useful; satisfaction by observer (and reporter, if a different person) of credibility criteria</p>	<p>5. <i>Evaluation</i>: To assess the credibility of statements or other representations which are accounts or descriptions of a person's perception, experience, situation, judgment, belief, or opinion; and to assess the logical strength of the actual or intended inferential relationships among statements, descriptions, questions or other forms of representation (Sub-skills: Assessing Claims, Assessing Arguments)</p>	<p>7. <i>Applying standards</i>: Judging according to established personal, professional, or social rules or criteria</p>
<p>11. <i>Making and judging value judgments</i>: Background facts, consequences, prima facie application of acceptable principles, considering alternatives, balancing, weighing, and deciding (No comparable skill)</p>	<p>6. <i>Self-regulation</i>: To monitor self-consciously one's cognitive activities, the elements used in those activities, and the results educed, particularly by applying skills in analysis and evaluation to one's own inferential judgments with a view toward questioning, confirming, validating, or correcting either one's reasoning or one's results (Sub-skills: Self-examination, Self-correction)</p>	<p>(Comparable to habits of mind: reflection) 8. <i>Reflection</i>: Contemplation upon a subject, especially one's assumptions and thinking for the purposes of deeper understanding and self-evaluation</p>
<p>12. <i>Interacting with others</i>: Employing and reacting to fallacy labels, logical strategies, rhetorical strategies, argumentation; presenting a position, oral or written</p>	<p>(No comparable skill)</p>	<p>(No comparable skill)</p>

Appendix 2: Comparison of Critical Thinking Dispositions and Habits of Mind

(Modified from Rubinfeld & Scheffer, 2006, pp. 19–20)

Critical thinking dispositions	Habits of mind for critical thinking
Ennis (1987)	Scheffer and Rubinfeld (2000)
1. <i>Seek a clear statement of the thesis or question</i>	1. <i>Inquisitiveness</i> : An eagerness to know by seeking knowledge and understanding through observation and thoughtful questioning in order to explore possibilities and alternatives
2. <i>Try to be well-informed</i>	
3. <i>Seek reasons</i>	2. <i>Intellectual integrity</i> : Seek the truth through sincere, honest processes, even if the results are contrary to one's assumptions and beliefs
4. <i>Seek as much precision as the subject permits</i>	
5. <i>Use and mention credible sources</i>	
6. <i>Deal in an orderly manner with the parts of a complex whole</i>	3. <i>Perseverance</i> : Pursuit of a course with determination to overcome obstacles
7. <i>Try to remain relevant to the main point</i>	4. <i>Contextual perspective</i> : Considerate of the whole situation, including relationships, background and environment, relevant to some happening
8. <i>Keep in mind the original and/or basic concern</i>	
9. <i>Take into account the total situation</i>	
10. <i>Look for alternatives</i>	5. <i>Flexibility</i> : Capacity to adapt, accommodate, modify or change thoughts, ideas, and behaviors
	6. <i>Confidence</i> : Assurance of one's reasoning abilities
11. <i>Use one's critical thinking abilities</i>	

<p>12. <i>Be open-minded</i>: Consider seriously others' points of view than one's own (dialogical thinking); reason from premises with which one disagrees — without letting the disagreement interfere with one's reasoning (suppositional thinking); withhold judgment when the evidence and reasons are insufficient</p> <p>13. <i>Be sensitive to the feelings, level of knowledge, and degree of sophistication of others</i></p>	<p>6. <i>Open-mindedness</i>: Being tolerant of divergent views and sensitive to the possibility of one's own bias</p>	<p>7. <i>Open-mindedness</i>: A viewpoint characterized by being receptive to divergent views and sensitive to one's biases</p>
<p>14. <i>Take a position (and change a position) when the evidence and reasons are sufficient to do so</i></p>	<p>7. <i>Analyticity</i>: Prize the application of reasoning and the use of evidence to resolve problems, anticipate potential conceptual or practical difficulties, and consistently be alert to the need to intervene</p>	<p>(No comparable habit of mind)</p>
<p>(No comparable disposition)</p>	<p>8. <i>Self-regulation</i>: Monitor self-consciously one's cognitive activities, the elements used in those activities, and the results educed, particularly by applying skills in analysis and evaluation to one's own inferential judgments with a view toward questioning, confirming, validating, or correcting either one's reasoning or one's results</p>	<p>8. <i>Reflection</i>: contemplation upon a subject, especially one's assumptions and thinking for the purposes of deeper understanding and self-evaluation</p>
<p>(No comparable disposition)</p>	<p>(No comparable disposition)</p>	<p>9. <i>Intuition</i>: Insightful sense of knowing without conscious use of reason</p>
<p>(No comparable disposition)</p>	<p>(No comparable disposition)</p>	<p>10. <i>Creativity</i>: Intellectual inventiveness used to generate, discover, or restructure ideas; imagine alternatives</p>

Appendix 3: Four Habits of Mind for Critical Thinking
Comparison of the Characteristics of Critical Thinking With Four Habits of Minds for Critical Thinking

Mission	Nickerson (1987)	Ferrett (1997)	Facione (1990)	Daniel (2001)	Becken (1997)	Lacey & Pritchett (2003)	Alfaro-Lefevre (2004)	SNjourney (2007)	Petress (2004)	ATEEC (2003) *	Gorman-Gelder et al. (2004) *	Wade (1995)	Kienzler (2001)
Fair and open-mindedness	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Truth-seeking	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Understanding comprehensively	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Judging reasonably (Others)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

* Cited in Petress (2004).

Fair and Open-mindedness

Elements	Characteristics of critical thinking
<ul style="list-style-type: none">• Fair and open-mindedness• Willing to question the assumptions• Attempt to clarify difficult issues• Review evidence	<ul style="list-style-type: none">• Being open-minded (Daniel, 2001)• Fair-minded in evaluation (Facione, 1990)• Open-minded (Facione, 1990)• Objectivity: Are supporting materials fair and undistorted? Does support originate from expert sources? (Petress, 2004)• Sensitive to the difference between the validity of a belief and the intensity with which it is held (Nickerson, 1987)• Analyze assumptions and biases (Wade, 1995)• Objective (Daniel, 2001)• Identify and question assumptions (Kienzler, 2001)• Explore underlying thinking and assumptions (SNJourney, 2007)• Assess the statements, which are made for their veracity and coherence, and evaluates the arguments and their accompanying propositions and hypothesis for value, objectivity and focus on the issue under review (Ferret, 1997)
→	<i>Willing to clarify difficult issues, question the assumptions, review evidence</i>
<ul style="list-style-type: none">• Reflect on his/her own point of view• Avoid biases or prejudice• Sensitive to his/her own bias• Not influenced by personal feelings or the advantage related to the groups he/she belongs to	<ul style="list-style-type: none">• Reflective and self-corrective: Carefully consider meaning of data and interpersonal interactions, ask for feedback; correct own thinking, alert to potential errors by self and others, find ways to avoid future mistakes (Alfaro-LeFevre, 2004)• Self-correction (Daniel, 2001)• Open and fair-minded: Question how own viewpoints are influencing thinking (Alfaro-LeFevre, 2004)• Willing to examine his/her beliefs, assumptions, and opinions and weigh them against facts (Ferret, 1997)• Self-critical (Daniel, 2001)• Habitually question one's own views and attempt to understand both the assumptions that are critical to those views and the implications of the views (Nickerson, 1987)• Self-aware: Clarify biases, inclinations, strengths, and limitations (Alfaro-LeFevre, 2004)• Recognize the fallibility of one's own opinions, the probability of bias in those opinions, and the danger of weighting evidence according to personal preferences (Nickerson, 1987)• Honest in facing personal biases (Facione, 1990)• Self-aware: Acknowledge when thinking may be influenced by emotions or self-interest (Alfaro-LeFevre, 2004)• Avoid emotional reasoning (Wade, 1995)
→	<i>Keen to reflect on their own point of view in order to avoid biases, prejudice, and being influenced by personal feelings and self and group interests</i>

<ul style="list-style-type: none"> • Welcome and consider different viewpoints honestly, patiently, and empathetically • Consciously consider situations from multiple perspectives • Willing to tolerate divergent views • Treat all viewpoints equally • Accurately reconstruct the views of others • Reason from ideas other than their own 	<ul style="list-style-type: none"> • Willing to submit their ideas and experiments to peer review; be able to accept — challenges and criticism to their work; and submit their findings to repeat tests (Gorman-Gelder et al., 2004) • Likely to listen to others, and to consider input when making decisions (Beeken, 1997) • Empathetic: Listen well; show ability to imagine others' feelings and difficulties (Alfaro-LeFevre, 2004) • Always willing to listen carefully and be able to give feedback. This again presupposes that the individual is a subject-matter-expert in the area of review, and that the individual is able to give the appropriate feedback necessary (Ferrett, 1997) • Sensitive to diversity: Express appreciation of human differences related to values, culture, personality, or learning style preferences; adapt to preferences when feasible (Alfaro-LeFevre, 2004) • Open and fair-minded: Show tolerance for different viewpoints (Alfaro-LeFevre, 2004) • Sensitive to others (Daniel, 2001) • Use ethical considerations (Daniel, 2001)
<p>→ Welcome and consider different viewpoints equally with honest, patient and empathy</p> <ul style="list-style-type: none"> • Think in new ways • Flexible in mindset 	<ul style="list-style-type: none"> • Able to adjust opinions when new facts are found (Ferrett, 1997) • Willing to reconsider (Factone, 1990) • Criticism, proposing of alternatives (Daniel, 2001) • Flexible (Facione, 1990) • Open to possibilities (SNJourney, 2007) • Creative (Daniel, 2001) • Flexible: Change approaches as needed to get the best results (Alfaro-LeFevre, 2004) • Anticipate the probable consequences of alternative actions (Nickerson, 1987)
<p>→ Possess flexible mindsets and are able to think in new ways</p> <ul style="list-style-type: none"> • Suspend judgment until more information is gathered 	<ul style="list-style-type: none"> • Suspend judgment until you have all the data (SNJourney, 2007) • Suspend judgment (be objective and factual) (Lacey & Pritchett, 2003) • Suspend judgment in the absence of sufficient evidence to support a decision (Nickerson, 1987) • Suspend judgment until all of the facts have been gathered and considered (Ferrett, 1997) • Careful and prudent: Seek help when needed; suspend or revise judgment as indicated by new or incomplete data (Alfaro-LeFevre, 2004) • Evidence being rated, by the critical thinker, based on sufficiency. Is there an adequate amount of support for claims? (Petress, 2004)
<p>→ Suspend judgment until more information is gathered</p> <p>Fair and open-minded critical thinkers are willing to clarify difficult issues, question the assumptions, review evidence, and suspend judgment until more information is gathered. They are keen to reflect on their own point of view in order to avoid biases, prejudice, and being influenced by personal feelings and self and group interests. They welcome and consider different viewpoints equally, honestly, and patiently. They also possess flexible mindsets and are able to think in new ways.</p>	

Truth-seeking

Elements	Characteristics of critical thinking
<ul style="list-style-type: none">• Truth-seeking• Desire for the best knowledge, even if it does not support one's own beliefs	<ul style="list-style-type: none">• Habitually inquisitive (Facione, 1990)• Focus on inquiry (Facione, 1990)• A keen power of observation; many times it is the miniscule, the incidental, or the tangential that holds the mystery of our inquiries (Gorman-Gelder et al., 2004)• Curious and inquisitive: Look for reasons, explanations, and meaning; seek new information to broaden understanding (Alfaro-LeFevre, 2004)• Examining evidence (Wade, 1995)• Aware of the fact that one's understanding is always limited, often much more so than would be apparent to one with a non-inquiring attitude (Nickerson, 1987)• Recognize one's limitations (ATEEC, 2003)• Able to admit a lack of understanding or that the information available is not substantive enough to make a good analysis and evaluation of the issue under review (Ferret, 1997)• Have an interest in finding new solutions; in this way, being curious and always seeking continuous improvement in understanding the world (Ferret, 1997)• Honest and upright: Seek the truth, even if it sheds unwanted light; uphold standards; admit flaws in thinking (Alfaro-LeFevre, 2004)• Improvement-oriented (self, patients, systems): Self — Identify learning needs; find ways to overcome limitations, seek out new knowledge. (Alfaro-LeFevre, 2004)• Persistent in seeking results which are precise as the subject and the circumstance of inquiry permitted (Facione, 1990)

→ ***Desire for the best knowledge, even if it does not support one's own beliefs***

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- Eager to ask questions
 - Recency: Is offered support current rather than being out-of-date? (Petress, 2004)
 - Reliability: Does the support for arguments have a good track record? Does evidence relied upon emanate from expert sources? (Petress, 2004)
 - Ask "Why?" and "Why not?" (SNJourney, 2007)
 - Ask questions (Wade, 1995)
 - Ask pertinent questions: the questions and the discussion are focused on the issue at hand (Ferrett, 1997)
 - Doubt and search for ethical criteria (Daniel, 2001)
 - Access: Are supporting materials open for receivers' verification? Are secret or anonymous sources avoided? (Petress, 2004)
 - Evaluate the credibility of sources (SNJourney, 2007)

→ **Eager to ask questions**

- Identify relevant sources
- Determine appropriate data to collect (Lacey & Pritchett, 2003)
- Diligent in seeking relevant information (Facione, 1990)
- Relevance: Is the evidence presented pertinent to the issue at hand? (Petress, 2004)
- Able to reject information that is incorrect or irrelevant (Ferrett, 1997)
- Seek a multiplicity of voices and alternatives on a subject (Kienzler, 2001)
- Look for "proof": that a set of statements is true and represent the best fact available in a field of practice (Ferrett, 1997)
- Look for evidence to support assumptions and beliefs (Ferrett, 1997)
- Have a sense of curiosity, and be an active investigator of facts, opinions and points of view (Ferrett, 1997)
- Seek themes, patterns, trends (SNJourney, 2007)
- Gather objective, subjective, historical and current data from all senses

→ **Search for relevant evidence, facts or knowledge (e.g., objective, subjective, historical and current data, etc.) in a given context from all senses**

Critical thinkers are also truth-seekers who desire for the best knowledge, even if it does not support their own beliefs. They are eager to ask questions and search for relevant evidence, facts or knowledge (e.g., objective, subjective, historical and current data, etc.) in a given context from all senses.

Understanding Comprehensively

Elements	Characteristics of critical thinking
<ul style="list-style-type: none">• Understand comprehensively• Develop an in-depth and comprehensive understanding of the information from multiple perspectives	<ul style="list-style-type: none">• Understand the difference between reasoning and rationalizing (Nickerson, 1987)• Understand the idea of degrees of belief (Nickerson, 1987)• Can think and go beyond the current issue (Beeken, 1997)• Clear about issues (Facione, 1990)• Well-informed (Facione, 1990)• Transferable to other contexts (Daniel, 2001)• Transfer knowledge from one situation to another (Lacey & Pritchett, 2003)• Explain variance from expected outcomes (Lacey & Pritchett, 2003)
<p>→ <i>Develop an in-depth understanding of an event by considering multiple sources of information</i></p> <ul style="list-style-type: none">• Compare and organize all the information from diverse sources in a concise, coherent and meaningful way	<ul style="list-style-type: none">• Search for coherence (Daniel, 2001)• Validate important from unimportant data (Lacey & Pritchett, 2003)• Organize and categorize the data in a meaningful framework that relates to nutrition problems (Lacey & Pritchett, 2003)• Organize thoughts and articulate them concisely and coherently (Nickerson, 1987)• Make interdisciplinary connections (Lacey & Pritchett, 2003)• Identify, assimilate, integrate, and evaluate information from diverse sources (ATEEC, 2003)• Make connections (Kienzler, 2001)• Able to sort/categorize what they observe, experience, research, and experiment with; such sorting/categorization frequently produces new knowledge (Gorman-Gelder et al., 2004)• Distinguish relevant from irrelevant data (Lacey & Pritchett, 2003)• Comparison (Daniel, 2001)• Use appropriate reference standard for comparison (Lacey & Pritchett, 2003)• Synthesis (Daniel, 2001)• Consistency: Are supporting elements internally and externally consistent with each other and with what we know from other experiences, observations, and sources? (Petress, 2004)• Distinction (Daniel, 2001)• Structure informally represented problems in such a way that formal techniques, such as mathematics, can be used to solve them (Nickerson, 1987)
<p>→ <i>Compare and organize all the information from diverse sources in a concise, coherent and meaningful way</i></p>	

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- Interpret and consider all the inferences, relationships, background and environment
 - Analytical and insightful: Identify relationships; express deep understanding (Alfaro-LeFevre, 2004)
 - Find patterns and relationships among the data and possible causes (Lacey & Pritchett, 2003)
 - See similarities and analogies that are not superficially apparent (Nickerson, 1987)
 - Relationships (Daniel, 2001)
 - Interpret data generated for records, files, and reports (ATEEC, 2003)
 - Make inferences (“if this continues to occur, then this is likely to happen”) (Lacey & Pritchett, 2003)
 - Able to detect, describe, report, and use relationships (i.e., cause-effect; co-cause, co-effect, symbiosis) between phenomena (Gorman-Gelder et al., 2004)
 - Distinguish between logically valid and invalid inferences (Nickerson, 1987)
 - Consider other interpretations (Wade, 1995)

→ ***Interpret and consider all the inferences, relationships, background and environment***

- Identify all the problems, misconceptions, fallacies, and ambiguity in context
- Define a problem (Wade, 1995)
- State the problem clearly and singularly (Lacey & Pritchett, 2003)
- Diagnose problems from a set of data and observations, and identify solutions (ATEEC, 2003)
- Analyze data for accuracy (ATEEC, 2003)
- Examine problems closely (Ferrett, 1997)
- Tolerate ambiguity (Wade, 1995)

→ ***Identify all the problems, misconceptions, fallacies and ambiguity in context***

Critical thinkers develop an in-depth understanding of an event by considering multiple sources of information; comparing and organizing all the information in a concise, coherent and meaningful way; interpreting and pondering all the inferences, relationships, background and environment; and identifying all the problems, misconceptions, fallacies and ambiguity in context.

Judging Reasonably

Elements	Characteristics of critical thinking
<ul style="list-style-type: none"> • Engage in deliberations with the intention of making a reasoned judgment of critical thinking • Seek reasons and evidence in making judgments and evaluate such reasons carefully • Conclude based on careful thought and reflection 	<ul style="list-style-type: none"> • Evaluation (Daniel, 2001) • Evaluative argument (Daniel, 2001) • Draw conclusions from a set of facts (i.e., data) (ATEEC, 2003) • Base judgments on facts and reasoning (SNJourney, 2007) • Be evaluative (Daniel, 2001) • Make comparative judgments from data (ATEEC, 2003) • Choose from among alternatives to determine a course of action (Lacey & Pritchett, 2003) • Prudent in making judgment (Facione, 1990) • Make holistic judgments (Daniel, 2001) • Use evidence skillfully and impartially (Nickerson, 1987)
<p>→ Make careful and reflective reasoned judgment</p>	
<ul style="list-style-type: none"> • Make judgment and decision with criteria • Recognize the necessity of criteria (rules and procedures) or grounds for judgment • Assess claims and make reasoned judgments • Find logical strategies to solve problems and persevere in the face of uncertainty 	<ul style="list-style-type: none"> • Use of criteria (Daniel, 2001) • Able to clearly define a set of criteria, for analyzing ideas; in this way, being a subject-matter-expert in the area that he/she is analyzing, and therefore, can contribute to an evaluation of the criteria for analyzing the ideas under review (Ferret, 1997) • Orderly in complex matters in the selection of criteria (Facione, 1990) • Apply assessment tools in valid and reliable ways (Lacey & Pritchett, 2003) • Apply problem-solving techniques in domains other than those in which learned (Nickerson, 1987) • Select appropriate indicators/measures (Lacey & Pritchett, 2003) • Select assessment tools and procedures (matching the assessment method to the situation) (Lacey & Pritchett, 2003) • Match intervention strategies with client needs, diagnoses, and values (Lacey & Pritchett, 2003)
<p>→ Use necessary criteria (rules and procedures) and logical strategies</p>	

<ul style="list-style-type: none"> • Distinguish sheer, unreasonable, and subjective opinions or preference in reasoning <p>→ <i>Distinguish sheer, unreasonable, and subjective opinions or preference in reasoning</i></p> <ul style="list-style-type: none"> • Strip a verbal argument of irrelevancies and phrase it in its essential terms (Nickerson, 1987) • Make decisions based on large and small amounts of information, some of which may be ambiguous (ATEEC, 2003)
<ul style="list-style-type: none"> • Apply reasons logically, fairly, rationally and with humility • Make predictions with evidence <p>→ <i>Make predictions with evidence; apply logical, fair and rational reasons</i></p> <ul style="list-style-type: none"> • Trustful of reason (Facione, 1990) • Independent thinkers, thinking on their feet with sound reasoning skills (Becken, 1997) • Logical (Daniel, 2001) • Support views with evidence (SNJourney, 2007)
<ul style="list-style-type: none"> • Find the logical cause and effect • Draw independent inferences <p>→ <i>Draw the logical cause and effect and draw independent inferences</i></p> <ul style="list-style-type: none"> • View situations from another person's perspective <p>→ <i>View situations from other perspectives</i></p>

By using necessary criteria (rules and procedures) and logical strategies, critical thinkers make careful and reflective reasoned judgment by finding the logical cause and effect; drawing independent inferences; making predictions with evidence; viewing situations from other perspectives; applying logical, fair and rational reasons; and distinguishing sheer, unreasonable, and subjective opinions or preferences in their reasoning.

Others

Characteristics of critical thinking

- Able to anticipate occurrences, results, or accidents; anticipation is part of thinking ahead (Gorman-Gelder et al., 2004)
- Able to see that critical thinking itself is a lifelong process of self-assessment and learning (Ferret, 1997)
- Alert to context: Look for changes in circumstances that warrant a need to modify thinking or approaches (Alfaro-LeFevre, 2004)
- An active imagination that allows never-before-seen phenomena to be interesting and therefore become useful in their work (Gorman-Gelder et al., 2004)
- Autonomous and responsible: Show independent thinking and actions; begin and complete tasks without prodding; express ownership of accountability (Alfaro-LeFevre, 2004)
- Avoid oversimplification (Wade, 1995)
- Become facile with abstract thought and be able to share abstractions in coherent ways with others (Gorman-Gelder et al., 2004)
- Can do crisis intervention, taking care of problems on their own (Beeken, 1997)
- Confident and resilient: Express faith in ability to reason and learn; overcome disappointments (Alfaro-LeFevre, 2004)
- Correlate results and plan action needed (ATEEC, 2003)
- Courageous: Stand up for beliefs; advocate for others; don't hide from challenges (Alfaro-LeFevre, 2004)
- Creative (Daniel, 2001)
- Creative: Offer alternative solutions and approaches; come up with useful ideas (Alfaro-LeFevre, 2004)
- Decide between discharge or continuation of nutrition care (Lacey & Pritchett, 2003)
- Define the nutrition prescription or basic plan (Lacey & Pritchett, 2003)
- Define where patient/client/group is now in terms of expected outcomes (Lacey & Pritchett, 2003)
- Demand and use adequate time to solve problems and to think about what is done (Gorman-Gelder et al., 2004)
- Follow hunches (SNJourney, 2007)
- Foster active involvement (Kienzler, 2001)
- Genuine: Show authentic self; demonstrate behaviors that indicate stated values (Alfaro-LeFevre, 2004)

- Have clear, concise communication skills, making their expectations easily understood (Beeken, 1997)
 - Have the intuition of knowing (Beeken, 1997)
 - Healthy: Promote a healthy lifestyle; use healthy behaviors to manage stress (Alfaro-LeFevre, 2004)
 - Hypothesis (Daniel, 2001)
 - Improvement-oriented (self, patients, systems): Patients — Promote health; maximize function, comfort, and convenience. Systems — Identify risks and problems with health care systems; promote safety, quality, satisfaction, and cost containment (Alfaro-LeFevre, 2004)
 - Initiate behavioral and other interventions (Lacey & Pritchett, 2003)
 - Learn independently and have an abiding interest in doing so (Nickerson, 1987)
 - Logical and intuitive: Draw reasonable conclusions (if this is so, then it follows that ... because ...); use intuition as a guide to search for evidence; act on intuition only with knowledge of risks involved (Alfaro-LeFevre, 2004)
 - Nuance (Daniel, 2001)
 - Observe for nonverbal and verbal cues that can guide and prompt effective interviewing methods (Lacey & Pritchett, 2003)
 - Patient and persistent: Wait for right moment; persevere to achieve best results (Alfaro-LeFevre, 2004)
 - Prioritize the relative importance of problems for patient/client/group safety (Lacey & Pritchett, 2003)
 - Proactive: Anticipate consequences, plan ahead, act on opportunities (Alfaro-LeFevre, 2004)
 - Realistic and practical: Admit when things aren't feasible; look for user-friendly solutions (Alfaro-LeFevre, 2004)
 - Recognize and correct discrepancies (ATEEC, 2003)
 - Rule in/rule out specific diagnoses (Lacey & Pritchett, 2003)
 - Self-disciplined: Stay on task as needed; manage time to focus on priorities (Alfaro-LeFevre, 2004)
 - Set goals and prioritize (Lacey & Pritchett, 2003)
 - Specify the time and frequency of care (Lacey & Pritchett, 2003)
 - Take on the role of lifelong learning as a challenge and apply to that challenge to make contributions in the world (Ferrett, 1997)
 - Turn mistakes into learning opportunities (SNJourney, 2007)
 - Well-groomed, self-confident, and "professional" (Beeken, 1997)
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Appendix 4: Curriculum Framework for Liberal Studies

(CDC & HKEAA, 2007)

Area of study	Related values and attitudes	Independent Inquiry Study
<p>Self and Personal Development <i>Module 1: Personal Development & Interpersonal Relationships</i></p> <ul style="list-style-type: none"> Theme 1: Understanding oneself What challenges and opportunities does a person have during adolescence? Theme 2: Interpersonal relationships What interpersonal factors facilitate adolescents to reflect upon and prepare for the transition to adulthood? 	<ul style="list-style-type: none"> Adaptability to change; responsibility; self-esteem; self-reflection; rationality; self-discipline; independence Cooperation; gender equity; empathy; integrity; self-reflection; self-determination; respect for self; respect for others; social harmony; sense of responsibility; interdependence 	<p>Suggested themes:</p> <ul style="list-style-type: none"> Media Education Religion Sports Art Information and communication technology (ICT)
<p>Society and Culture <i>Module 2: Hong Kong Today</i></p> <ul style="list-style-type: none"> Theme 1: Quality of life Which directions might be chosen in maintaining and improving Hong Kong residents' quality of life? Theme 2: Rule of law and socio-political participation How do Hong Kong residents participate in political and social affairs and come to grips with rights and responsibilities with respect to the rule of law? Theme 3: Identity How are the identities of Hong Kong residents developed? 	<ul style="list-style-type: none"> Respect for quality and excellence; sustainability; rationality; sensitivity; care and concern Respect for the rule of law; participation; human rights and responsibilities; democracy; justice Sense of belonging; plurality; open-mindedness; individuality; interdependence 	
<p><i>Module 3: Modern China</i></p> <ul style="list-style-type: none"> Theme 1: China's reform and opening-up What impact has reform and opening-up had on the overall development of the country and on people's life? 	<ul style="list-style-type: none"> Solidarity; patriotism; sustainability; human rights and responsibilities; care and concern; justice 	

- Theme 2: Chinese culture and modern life
With respect to the evolution of concepts of the family, what kind of relationship between traditional culture and modern life has been manifested?
To what extent are traditional customs compatible with modern Chinese society?

- Culture and civilization heritage; respect for different ways of life, beliefs and opinions; plurality; sensitivity; appreciation

Module 4: Globalization

- Theme 1: Impact of globalization and related responses
Why do people from different parts of the world react differently to the opportunities and challenges brought by globalization?

- Interdependence; justice; cooperation; plurality;
- Culture and civilization heritage; adapting to changes; open-mindedness; empathy; participation; mutuality

Science, Technology and the Environment

Module 5: Public Health

- Theme 1: Understanding of public health
How is people's understanding of disease and public health affected by different factors?
- Theme 2: Science, technology and public health
To what extent does science and technology enhance the development of public health?

- Valuing the suggestions of others; respect for evidence; respect for different ways of life, beliefs and opinions; cultural heritage
- Betterment of humankind; human rights and responsibilities; cooperation; moral considerations

Module 6: Energy Technology & the Environment

- Theme 1: The influences of energy technology
How do energy technology and environmental problems relate to each other?
- Theme 2: The environment and sustainable development
Why has sustainable development become an important contemporary issue? What is the relationship between its occurrence and the development of science and technology?

- Betterment of humankind; respect for evidence; interdependence
 - Responsibility; caring for the living and non-living environments; betterment of humankind; sustainability; simplicity
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