Does the biological aspect affect the Emotional Intelligence?

I. Introduction

There are various schools of thought concerning the biological aspect and the Emotional Intelligence (EI). Some researchers have found no evidence, others have found no significant evidence, and others have found evidence that the biological aspects in a human being do affect the EI. For the purpose of this research, the focus will be on the evidence found, that the biological aspect affects the EI.

II. Definitions

To be on the same frame of thought, the definitions of biology and EI will be presented. These are as follows:

- Biology is the physical organism
- Emotional Intelligence is the psychological part where part of the biological organism (brain) interacts with the rest of the body and there is the ability to understand yourself and others (Goleman, 1995; Cherniss & Adler, 2000; Cognitive and Emotional Health: The Healthy Brain Workshop, 2001). Given these definitions then it may be extrapolated that the brain is the organism that within the body signals to the senses: smell, touch, sight, audio, taste, and perception (known as the sixth sense).

III. Literature Review

It would be superfluous to mention that the Intellectual Quotient (IQ) is an instrument to measure the individual's ability to learn and to identify the individual's degree of intelligence. In the mid sixties, the first term of EI appeared in a German publication, written by Leuner, where he discussed women who rejected their social roles by being separated by their mothers at an early age (Clark, 2004). Clark also reports on Payne in 1986 writing about EI in his doctoral dissertation in English. Payne advocated that EI should be introduced in the schools by “liberating emotional experience through therapy. Winkowski (2003) contends that education should not focus on the academic abilities but that it should be as a means to cope in life. Clark (2004) also states that Jack Mayer, Peter Salovey, and David Caruso among others researched the EI topic as well. According to Clark, it was Daniel Goleman who made it popular in the late 90s. He reiterates that intelligence is difficult to define and a need to develop a measuring scale was imperative. This would lead to ranking people on an emotional scale versus and intelligence scale. He posits that researchers (Goleman, Reuven Bar-On, Mayer, Salovey, Caruso, and Gardner) have four definitions of EI they seem to approach EI from three different perspectives. These are the following:

“1. Biological – emotions are used to make intelligent decisions

2. Symbol – the ability to recognize and express emotions in yourself and others

3. Knowledge – emotional management”.

With a high IQ, the person is able to solve problems from the abstract to the concrete stages. The individual may have a high IQ and have a high EI, thus making the individual capable of solving abstract problems while at the same time the individual is capable of being sensitive to the needs of others and interact with others in a successful manner. This makes the individual a holistic human being. Whereas, if the individual only has a high IQ and a low EI this would mean that the individual has the necessary intelligence to solve problems but the human aspect is hindered, not allowing a person to have successful and agreeable interactions with others (Science and Nature, 2004). If, however, the individual scored low on the IQ instrument of measurement and high in the EI instrument of measurement, this would make the individual a likeable person but have difficulties in solving high ranking problems making it difficult to solve them.

Science and Nature (2004) contend that a combination of high intellectual intelligence and low emotional intelligence is relatively rare, and a person can be both intellectually and emotionally intelligent. It states that students that are self-motivated tend to do better in school exams and stay in school versus those students that have emotional difficulties, who tend to drop out of school.

It reports the negative side to this which is that, "low emotional intelligence can affect intellectual capabilities."…"Psychological test show feelings of rejection can dramatically reduce IQ by about 25%. Rejection increased feelings of aggressiveness and reduced self-control." It asserts that, "It is this quality of self-control, rather than being impulsive, which is regarded as necessary to perform well in IQ tests. So a low emotional intelligence may limit intellectual performance."

Science and Nature (2004) present various points. These are as follow:

- There are many kinds of intelligence (at least eight).
- Arguments whether intelligence is biological or socially determined.
- The brain although weighing 2.5% of the total bodyweight accounts for 20% of energy consumption while resting.
- Every year 10,000 people take the MENSA IQ test and 2,500 pass it to become members. Taking into consideration the last century, in the UK the average IQ has risen 3 points every decade.
- The IQ takes into consideration the culture, class, and gender in its tests.

Segal and Jaffe (2007) posit that people, in general, tend to do well when seeking a new job or are able to attract a mate well, however, they are not able to maintain those relationships. They claim that EI gives a person the skills to go beyond the initial stages and increase meaningful long term relationships at home and work.

They reiterate that the focus has tended to be on the intellectual interventions. They state that through research it has been found that:

- “the most powerful forms of communication contain no words, and take place at a much faster rate than speech.
- one person´s stress can block the communication process until both people again feel safe and can focus on one another.
- the adhesive that holds the communication process together is an emotional exchange triggered by primary biological emotions that include anger, sadness, fear and joy.
- the ability to be playful translates into saying power. Mutual fun and joy enables relationships to thrive in the face of stressful and challenging situations.
- with the above nonverbal skills in place, conflict can be flipped into opportunity, building trust by quickly repairing instances of rupture.”

They recommend several skills that will help the person communicate with emotional intelligence. These are as follows:

- The elastic high safety/low stress. This is the capacity to regulate stress.
- The glue: Exchange based on primary emotions. This holds the communication process together given the emotional exchange triggered by the biological emotions, such as anger, sadness, fear, joy, and disgust.
- The pulley: Wordless communication. This attracts the attention of others and maintains relationships, by using: eye contact, facial expression, tone of voice, posture, gesture, touch, intensity, timing, pace, and sounds that engage the brain to influence others.

- The ladder pleasure in interactive play. This is being playful and using humor in awkward, difficult, and embarrassing situations.
- The velvet hammer: Conflict as opportunity for trust-building. This is being able to respond to differences and disagreements at home and at the workplace. The person is able to manage stress, be emotionally available, communicate nonverbally, and laugh easily.

Segal and Jaffe (2007) summarize the ability to use these skills. This is as follows:

> "Taken together these skills give us the ability to respond flexibly and appropriately in any situation. If it sounds revolutionary, *it is*. If it sounds too simple, *it is not*. Real change engages the brain and is an interactive process. *Studies show that profound changes can be made in close relationships within 3-9 months – a rebirth no longer than one´s original creation*."

They assert that this information will help the person: to see themselves and others in a different light; to be able to separate damaging communication; to remain calm and focus independently from the situation; helps the person discover and improve the emotional awareness; include the playtime and joy in the relationship; and, reverse conflict and build trust and stay away from resentment. The person will also be able learn: The difference between talking and communicating; how to reach the mind and heart of another person; how to impact others non-verbally; how to repair affected feelings; and, preserve trust, develop admiration, and attract others.

Mathews, Zeidner, & Roberts (2002) found that the psychometric instruments that have been used have their limitations to measure emotional intelligence. They believe that the popularly known emotional intelligence is based on myth rather than on science, however, they do not discard the potential that the EI has in education, stimulate thought and action, and, research.

Abbot and Ryan (2001) assert that, humans are born to learn and that this differentiates people from the rest of the animal kingdom. They report that, “The old and essentially intuitive insights are now supported by the new biological understandings yielded by brain-imaging technologies developed since the late 1980s.” The brain has been studied by researchers through noninvasive brain mapping to watch the learning patterns of the activity on a computer screen (Abbot & Ryan, 2001; Gabriel, 2000). They have found that the brain reshapes itself according to the usage on non-usage and this confirms metacognition (thinking skills) can be learned and significant aspects of intelligence developed. Given this, they ascertain that, “Humans are predisposed to learn from and adapt to their environment”. They continue in that, “The link between emotions and intrinsic motivation should surprise no one; consequently, the sterility of emotionally drained and aesthetically neutered learning environments has to be understood as contributing to low learning achievement. A successful childhood and adolescence is to a large degree defined by learning how to control and channel one´s emotions to positive ends”…“A model of learning that focuses on the needs of all children will have multiple outlets beyond athletics for high performance that integrates intellect and emotions”. The authors posit the importance of academia augmenting extracurricular activities versus having educators and policymakers, and parents wanting to reduce these activities.

Abbot and Ryan (2001) state how throughout history education has included the punishment and reward strategies. To motivate students, educators use the reward system. A child may obtain pencils if they do well in an exam. Or a child may stay after school given bad behavior. They encourage educators rather than to use these venues, to have a more positive attitude and increase motivational types of activities (play, music, sports) thus creating a positive environment for positive educational outcomes, behaviors, and commitment of work from the students.

Encarta encyclopedia presents Howard Gardner, an American psychologist that in 1983 proposed the multiple intelligences. He identified seven, which are:

- Linguistic intelligence which include aptitude with speech and language.
- Logical-mathematical intelligence which is the ability to reason abstractly and solves mathematical and logical problems.
- Spatial intelligence perceives visual and spatial information conceptualizing the world in tasks such as navigation and art.
- Musical intelligence is having the ability to perform and appreciate music.
- Bodily-kinesthetic intelligence is using the body or portions of it in activities such as: dancing, athletics, acting, surgery, and magic.
- Interpersonal intelligence is having the ability to understand the self.

In the late 1990s Gardner, included an eighth intelligence.

- Naturalist intelligence, when a person recognizes and classifies plants, animals, and minerals.

According to Gardner a person has their own profile of intelligences where they have strengths and weakness.

Cherniss and Adler (2000) further attest that emotional intelligence include personal qualities, such as realistic self-confidence, personal integrity, knowledge of personal strengths and weaknesses, resilience in times of change or adversity, self motivation, perseverance, and getting along with others. According to these researchers, emotional intelligence is not a genetically set or set in early childhood. As much as the brain creates new connections and grows (from a neuroscientist point of view) so does the emotional intelligence.

They also make a point that with the increase of business globalization, the dependence on technical innovation, and the downsizing of businesses, organizations seek employers that have a high emotional intelligence, thus being able to interact positively with their fellow workers and customers. Goleman (2000) agrees with this point, in these times of change, people are not only being judged by their intelligence, training or expertise but by also including the aspects of how the person handles her/himself and each other. He points out that the emotional intelligence in companies is augmenting, in choosing who will be hired or not, who will be fired and who will be retained, and who is passed over or promoted in the workforce. Cherniss and Adler (2000) assert that a need for emotional learning needs to modify the emotional parts of the brain and that changing habits is more difficult than storing new information to the existent one. Navasaria (1998) as a psychology major, found in her research that outputs (behaviors) influence inputs (physiological mechanisms), thus making it an input/output mechanism (bi-directional).

Zeidner, Matthews, & Roberts (2003) posit that, “Cognitive abilities may also influence individual differences in emotional function. At the same time, the biological and sociocultural factors that influence EI interact in complex and interrelated ways”.

Brackett, Mayer, & Warner (2002) assessed in their study the discriminant, criterion, and incremental validity to measure the ability of emotional intelligence. Their sample consisted of college students (N=330). They took an ability test of EI, which is a measure of the Big Five personality traits and this provided information on Life Space scales that assessed a variety of self-care behaviors, leisure pursuits, academic activities, and interpersonal relations. They found that women scored significantly higher than the men in the EI, however in the Life Span criteria it was more predictive for men than for women.

They found that the lower EI in males was based on the inability to perceive emotions and to use emotion to process thought. It was primarily associated with negative outcomes (illegal drug and alcohol use), deviant behavior, and poor relations with friends for college-aged males but not for the females. They predicted that EI would positively correlate with better-quality relationships with peers and family by a vertical molecular-molar dimension (from the brain to the individual´s psychology to groups of individuals) and by a horizontal, internal-external dimension (from the individual brain and psychology to the outside environment, situations, and groups).

Boyatzis and Sala (2004) sustain that to be classified as an intelligence the following concept should be:

1) Related to neural-endocrine functioning;
2) Differentiated as to the neural and endocrine system;
3) Related to life and job outcomes; and,
4) Different from other personality constructs leading to understanding the human personality and behavior.

Goleman (1997) states that sociologist assert that the heart rules over the head, for instance, when the emotions make individuals to predicaments and tasks that the intellect alone may not handle, such as: danger, painful loss, persistence toward goals despite the frustrations, bonding with a mate, and building a family. He reiterates that feelings shape decisions and actions, and that feelings are more important than thought. Goleman (2000) contends that contrary to what people are told about the academic abilities in school, these are irrelevant to the standards of emotional intelligence placed in the workforce. He posits, that “The new measure takes for granted having enough intellectual ability and technical know-how to do our jobs; it focuses instead on personal qualities, such as initiative and empathy, adaptability and persuasiveness."… "If you are part of a management team, you need to consider whether your organization fosters these competencies or discourages them. To the degree your organizational climate nourishes these competencies; your organization will be more effective and productive. You will maximize your group's intelligence, the synergistic interaction of every person´s best talents."… "In a time with no guarantees of job security, when the very concept of a "job" is rapidly being replaced by "portable skills," these are prime qualities that make and keep us employable. Talked about loosely for decades under a variety of names, from "character" and "personality" to "soft skills" and "competence," there is at last a more precise understanding of these human talents, and a new name for them: emotional intelligence."

Goleman (1997; 2007) purports that he has been tracking cutting-edge in neuroscience and that this has led him to propose a foundation in brain science for the emotional intelligence model. Bailey (2003) poses that, "The dawning age of neuroscience promises not just new treatments for Alzheimer's and other brain diseases but enhancements to improve memory, boost intellectual acumen, and fine-tune our emotional responses." He states, however, that ethics should be considered when "tinkering directly with the organ from which all ethical reflection arises", especially given that people with a degenerative disease may not be in a position to give consent to be experimented on.

In the Investigation of Behavioral and Biological Correlates of Emotional Intelligence (2005) article, it is stated that there is not only a need to devise reliable and valid assessments tools but to also assess with brief instruments that are easily administered based on concrete items. It attests to the fact that plenty of research is done in assessing the validity of EI tests but research into the biological basis of EI measuring tests are lacking, although it is stated that, "…there is an abundance of evidence showing the biological signature of emotional functioning such as the neural responses associated with processing of facial expressions (Williams, 2005)". The aim of their research was to examine the relationship between self perceived EI measured by Self report EI tests. They had three hypotheses:

1) Scores on the STREIT and the BREIF will converge with scores on behavioral measures of EI specifically emotion facial recognition and perception ability.
2) Individuals with high emotional intelligence as measured by the BREIF will show greater emotion recognition accuracy, and greater event-related potential responses for emotional expression stimuli than individuals scoring low (reflecting differences in emotion perception and sensitivity).
3) Differences in mood (depression, anxiety, and stress) and personality will contribute to, but not account for, these differences in emotional intelligence and related differences in emotion recognition and emotion-related brain function.

In their method for Study 1) Components of Trait EI: Relationship between measures, they had forty healthy psychology students that ranged from 18 to 20 years of age. They completed the BREIF and the STREIT tests and two different emotional recognition tests. For Study 2) Trait EI and the brain function: Relationships between measures they had forty healthy subjects recruited from the Sydney area. They gathered information from the BREIF scores. The results, discussion, and conclusion are still on going.

The Cognitive and Emotional Health: The Healthy Brain Workshop (2001) aimed to address, "…the state of epidemiological research on demographic, social, and biological determinants of cognitive and emotional health in aging population, and the pathways by which cognitive and emotional health may reciprocally influence each other. Their purpose was to evaluate the state of exiting research, the value of secondary analyses of data, the need to further develop measuring instruments for future studies, and design future studies. They emphasized that, "It is clear that conditions in the body affect the brain, and that conditions in the brain affect the body, and this interrelationship should be factored into study designs."

They stated that, "Many results from studies are never reported because of inconclusive or negative results. It is important to carefully define the goals of future studies, and to include data sharing plans in the study designs to ensure that the data will eventually be available to the research community.

During the workshop they posited, that there are three possible mechanisms by which emotional health may interact with cognitive health. These include glucocordicord secretion (linked to stress); brain derived neurotrophic factor (BDNF) regulation of synaptic activity (also linked to stress), and cerebrovascular disease, a known cause of cognitive impairment which also may lead to a syndrome of " vascular depression" due to sub critical and frontal brain lesions. Demographic and social factors may affect all three of these mechanisms. Theories of emotion and cognition have focused on negative emotions – the effects of positive emotions seem to have been ignored as a possible factor in cognitive health.

It was noted in the conference, "…that a true consideration of emotional health separately from cognitive health is impossible because emotion is always involved in cognitive processes."… They asserted that other aspects of health will need to be integrated, such as: psychology, epidemiology, sociology, and other social, biomedical, and behavioral sciences.

They ascertained that the fields of psychology and epidemiology focus differently, concerning emotional health. Psychologists focus on theoretical perspectives and epidemiologists focus on the prevalence or incidence of emotional problems in the population. They suggest that researchers also need to understand the biology that underlies positive and negative emotions.

They upheld that the thought “use it or lose it” hypothesis is known to apply to cognitive aging, but not to emotional aging, however, it is not clear why this may be the case. Concerning the emotional health instruments of measurement, they posited that, “Researchers need to define the utility of measures of dysfunction in measuring emotional health.” … There needs to be conceptualization and “operationalization”. They reiterated that, researchers need to decide whether to measure the emotional domain or to include other positive psychological factors such as control and self-efficacy. Researchers also need to devise a practical approach for large scale studies and to examine Emotional Health in context – short-term (i.e. anger) and long-term (i.e. hostility).

They need to include how frequently different emotional traits need to be measured over time and how culturally sensitive different measures are. Some of these instruments of measurement have been tested in different cultures, but others have not and may not be as sensitive across cultures.

They proposed that mathematical/statistical methods to longitudinally assess health in these domains should be developed. They reported that, “Ideally, the biological parameters and the psychosocial parameters would be measured simultaneously and in a prospective way. However, such data does not currently exist.”

"Human brain and memory possess so many features which are yet to be investigated, understood and mastered that computers are far behind aspects." (Motah, 2006). Motah, asseverates that, "As humans, our life is determined and influenced by various dimensions: a biological inheritance and physical appearance that distinguish us from other living beings; a psychological make-up which determines our mental, emotional, linguistic, behavioural and moral aspects; a social need which affects all aspects of our existence and lifestyle; and a spiritual dimension which helps us to distinguish right and wrong." Motah (2006) asserts that artificial intelligence will always remain as "artificial" and that computers can never achieve true intelligence, thus needing human input.

Caudron (ND) makes the point that, Corporate America and executives are giving more importance to trust, confidence, empathy, adaptability and self-control. Soft-skills trainings are gaining new dimensions (Goleman, 1998).

Given Goleman´s research personality and character count on the job and the skills that contribute to emotional intelligence are teachable. "Skills training is typically very narrow and focused." … "To develop emotional intelligence, however, companies must focus on the broader parameters of organizational and behavioral change."

Winkowski (2003) states, "It has been shown that our emotions come from within us and is linked with the way the brain functions. Our emotional brain was developed before our thinking brain therefore we all have the tools from within, but the ability to increase and improve Emotional Intelligence can be learned and can strengthened through the proper training. Emotional Intelligence is not genetic; it is something that can be learned. By working on heightening our Emotional Intelligence, workplace productivity and relationships with fellow co-workers will substantially improve as well as having a dramatic effect on our personal relationships." … "One can argue that by applying this material in general manner, everyone in society could benefit from such knowledge. It is something that was shown, should and can be learned and worked on through schools and training programs."

IV. Conclusions

After an exhaustive search for relevant material in the area of how does the biological aspects affect emotional intelligence, it was found by this researcher that there is a lack of resources. Based on the researchers exposed herein, more research needs to be developed while others were in the process of research analysis and their results were not completed. There is computerized technological equipment that may identify the areas where stimuli and reactions occur in the brain, therefore, it may be extrapolated through the scarce material that EI is influenced by the biological system.

The importance of the EI is not only influencing education with school children but it is also being considered in the workforce. For academia and the workforce the importance of using (humor, play) are important aspects for individuals to feel relaxed, know how to control their emotions, and know how to interact with each other in different situations, conditions, and environments.

It was stressed in the literature that students should not be rewarded or punished (using the old academia standards of teaching). There should be preventive corrective methods in learning how to deal with a given situation. Recently, educators and managers are being trained to use EI strategies in the cognitive process for positive outcomes within a given field. The globalization is a major component being impacted by diversity leaving space for EI to ameliorate the existent differences found in cultures, traditions, and customs.

There is in importance not only to be intellectually empowered but to be emotionally as well. Not only are you an expert in your area of expertise but, you are able to interact with your students/classmates/colleagues while giving/receiving instructions, integrating, and interacting; all tuned to the goals and objectives in academia and in the workforce. In academia this may be reflected in grades and in the workforce, it will be reflected in the bottom line of the financial statements as many companies nowadays are turning more sensitive to their employees´ needs: gymnasium facilities, child care, and training encompassing EI elements to be implemented with colleagues.

It has been demonstrated throughout the research that the EI and the biological aspects are intertwined therefore a major usage of this combination is suggested to reach positive outcomes in an amicable environment. It would be superfluous to mention that in general only 5% to 10% of the brain is used. It may be inferred that by using this combination an increase of the mind usage may take place and the global environment may be more appropriate for all to live in.

It is a known fact that in the academia area, educators are beginning to be trained in language, cultures, history, traditions, and customs to become aware of how to treat, work with, and interact with their students to obtain a better teaching/learning environment. It is also known that in the workplace the same is being implemented to obtain positive business transactions within and without the immediate working surroundings.

Education and business transactions have flawed due to the fact that many elements were not taken into consideration. For years, educators have taught and evaluated from a white European perspective (Townsend, 2002) using their standards and methodologies without taking into consideration the diversity in the classroom; thus truancy, absenteeism, misbehaviors have arisen in the classroom. In the business world business transactions have had their share of problems, for instance, by thinking that by only translating the information into another language would suffice while not taking the EI into consideration.

If the EI had been taken into consideration along with the history, traditions, culture, and customs of the Thailand people, Coca-Cola's business transaction would not have failed by its translation. In the case of Nestle, if the company would have been sensitive to the African population's needs and existing living conditions they would have incorporated into the powdered milk's instructions that the water had to boil and thousands of infant lives´ would have been saved. In Venezuela, the business transaction would not have failed if the Chevrolet Company had been wise and sensitive enough to know that introducing the NOVA automobile would have failed. In Italy, nova means new, but, in Spanish it means no go. It was, therefore, understood by the Venezuelan's that they did not want to buy a car that did not work.

The more information that is acquired beyond the above mentioned along with the EI should be considered to obtain positive outcomes. In the long run what is needed is to join the biological aspects with EI for a better environment, better knowledge, and better outcomes.

According to the research herein exposed, studies should start early in life and continue as longitudinal studies for input into adulthood to be able to measure the development and differences. These longitudinal studies are not recommended in the elderly population since death is upon them and the studies may not be able to accomplish its aim (when they do not score well on cognitive measures).

If the computer was invented by man and the technical device is capable of calculating formulas, solving complicated calculations at a fast speed, then it is assumed that by trying to train the mind (biology) and train the EI (biology) it is possible that all humans are able to be more susceptible and sensitive enough to live and work together in a harmonious way, thus leading to better interactions among nations.

V. Recommendations

According to the research women obtain a higher EI in measurement instruments, further research should look into what makes the women obtain higher percentages than men. The following are questions for further research: What are men lacking to increase their EI? What further research should be identified given the combination of the biological aspect and the EI component? What further research should be identified given the combination of the biological aspects and the emotional intelligence component? What kinds of training should educators and employees receive to maximize the knowledge their students obtain through the school system and work environment? What type of EI measuring instruments should be planned, designed, developed, implemented, and evaluated and pilot tested for their validity and reliability?

REFERENCES

Abbot, J., & Ryan, T. (2001). The unfinished revolution: Learning, human behavior, community, and political paradox. *Association for Supervision and Curriculum Development.* Retrieved August 9, 2007 from http://www.ascd.org/portal/site/ascd/template.chapter/menuitem.b71d101a2f7c208cdeb3ffdb62108a0c/?chapterMgmtId=cde9177a55f9ff00VgnVCM1000003d01a8c0RCRD

An investigation of behavioral and biological correlates of emotional intelligence. Retrieved August 17, 2007 from http://www.brainnet.org.au/brainnet/research/proj_details.jsp?projID=169

Association for the Advancement of Artificial Intelligence. (2007). Cognitive Science: Nature of intelligence. Retrieved August 9, 2007 from http://www.aaai.org/AITopics/html/natintell.html

Bailey, R. (2003). The battle for your brain. Retrieved August 17, 2007 from http://www.mywire.com/pubs/Reason/2003/02/01/156088?&pbl=82

Biological bases of behavior. Retrieved August 10, 2007 from http://www.eastlongmeadow.org/High_School/departments/Social/ap_psych/unit_two.htm

Boyatzis, R. E., & Sala, F. (2004). Assessing emotional intelligence competencies. Retrieved August 13, 2007 from http://www.eiconsortium.org/research/Assessing_Emotional_Intelligence_Competencies.pdf

Brackett, M. A., Mayer, J. D., & Warner R. M. (2004). Emotional intelligence and its relation to everyday behaviour. *Personality and Individual Differences, 36, 1387-1402.*

Brain Science Institute (2007). *The biology of individual differences research unit.* Retrieved August 13, 2007 from http://www.swinburne.edu.au/lss/bsi/researchunits/ru_bid.html

Caudon, S. (ND). The hard case for soft skills. Retrieved August 17, 2007

From http://learning.monster.com/learning/resources/article/110180?id=b4e888fdac11a2aff0282cebe5ec7377

Cherniss, C., & Adlet, M. (2000). *Promoting emotional intelligence in organizations.* Alexandria, Virginia: ASTD Press.

Clark, D. (2004). *Emotional Intelligence*. Retrieved August 9, 2007 from http://www.nwlink.com/~donclark/performance/ei.html

Cognitive and emotional health: The healthy brain workshop. (2001) Retrieved August 17, 2007 from http://trans.nih.gov/cehp/NINDSSummary.pdf

Encarta MSN (2007). Intelligence. Retrieved August 9, 2007 from http://encarta.msn.com/encyclopedia_761570026_5/Intelligence.html

Gabriel, G. (2000). What is emotional intelligence? Retrieved August 17, 2007 from http://www.brainconnection.com/topics/?main=fa/emotional-intelligence

Goleman, D. (1997). Emotional intelligence: Why it can matter more than IQ. New York: Bantam.

Goleman, D. (2000). Working with emotional intelligence. New York: Bantam.

Goleman, D. (2004). Primal leadership: Leadership to lead with emotional intelligence. Cambridge, Massachusetts: Harvard Business School Press.

Goleman, D. (2007). Social intelligence: The new science of human relationships. New York: Bantam.

Hein, S. (2005). Emotional Intelligence. Retrieved August 10, 2007 from http://eqi.org/history.htm

Kemp, A. H., Cooper, N. J., Hermens, G., Gordon, E. B., & Williams, L. M. (2005). Toward an integrated profile of emotional intelligence: Introducing a brief measure. *Journal of Neuroscience*, 4, 41-61.

Matthews, G., Zeidner, M., & Roberts, R. D. (2002). *Emotional* *intelligence: Science and myth*. Cambridge, Massachusetts: MIT Press.

Motah, Mahendrenath. (2006).The ontogeny of memory and Learning: Natural intelligence versus artificial intelligence in information The ontogeny of memory and Learning: Natural intelligence versus artificial intelligence in information technology education. Retrieved August 17, 2007 from http://proceedings.informingscience.org/InSITE2006/ProcMota237.pdf

Navasaria, N. (1994-2007). *The understanding of behavior and the brain.* Retrieved August 13, 2007 from http://serendip.brynmawr.edu/bb/neuro/neuro98/202s98-paper1/Navasaria.html

Science and Nature (2007). *Intelligence*. Retrieved August 9, 2007 from http://www.bbc.co.uk/science/hottopics/intelligence/index.shtml#definition

Segal, J., & Jaffe, J. (2007). *Relationship help: Emotional intelligence in communication.* Retrieved August 9, 2007 from http://www.helpguide.org/mental/improve_relationships.htm

Simmons Management Systems. (ND). Emotional Intelligence. Retrieved August 10, 2007 from http://www.spsurvey.com/AT-Emotional_Intelligence_Definition_1a.htm

Taylor, G. J., Parker, J. D. A., & Bagby, R. M. (1999). Emotional intelligence and the emotional brain: Points of convergence and implications for psychoanalysis. *Journal of American Academy of Psychoanalysis*, 27, 339-354.

Topic four: Emotional intelligence. Retrieved August 17, 2007 from http://www.defence.gov.au/dsg/organisation/psmp/documents/unit_3/U3Topic_04.pdf

Townsend, B. L. (2002). Leave no teacher behind: a bold proposal for teacher education. *Qualitative Studies in Education*, 15, 727-738.

Westra, C. (ND). Light and emotional transformation: Eight step recipe for transforming emotions into joy. *Emotional Transformation.* Retrieved August 13, 2007 from http://lightisreal.com/emotionlight.html?gclid=CPKezp_s840CFQlQWAodnxnfLw

Winkowski, V. (2003). Emotional intelligence. Retrieved August 17, 2007 from http://cfcj-fcjc.org/clearinghouse/drpapers/2003-dra/winkowski.pdf

Zeidner, M., Matthews, G., Roberts, R. D., & MacCann, C. (2003). Development of emotional intelligence: Towards a multi-level investment model. *Human Development, 46, 69-96.*