

# Harnessing the Power of Emotional Intelligence, Scientific Literacy, and Problem-Solving Skills for Successful Living.

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## ABSTRACT

Emotional intelligence is a person's ability to deal successfully with other people while controlling his/her feelings. The basic understanding of science that should be possessed by everyone, not only professionals in scientific fields are frequently referred to as scientific literacy. Intellectual intelligence helps us to understand and navigate the world on one level, but emotional intelligence helps to succeed in life. That is why some people that are academically brilliant are socially inept and unsuccessful. In addition to being emotionally intelligent and scientifically literate, successful living entails ability to tackle problems. Emotional intelligence is directly linked to self-esteem, self-awareness, compassion, empathy and adaptability which are important predictors of success in life. Harnessing the power of emotional intelligence, scientific literacy and problem-solving skills therefore means exhibiting traits of emotional intelligence while following the scientific habits of mind and problem solving strategies like analyses, brainstorming, lateral thinking and trial-and-error to arrive at solution to some challenges or problems in life.

(Keywords: emotional intelligence, scientific literacy, problem solving skills, Bar-On model, successful living)

## INTRODUCTION

Emotional intelligence involves such skills as self-awareness, managing emotions and self-control of impulses. Although the construct of emotional intelligence (EI) is relatively new and under developed, however research evidences on it so far indicate a construct that appears appealing and worthy of further investigation. Numerous studies (Cooper and Sawaf, 1997; Salovey and

Grewal, 2005; Taksic, and Mohoric, 2006), have identified EI underpins many of the best decisions and most satisfying and successful lives. EI has been shown to predict success in academic achievement, employment, marriage and physical health. Bar-On (1996) explained that emotional intelligence is one's ability to deal successfully with other people and while controlling one's feelings. Hence, emotional intelligence involves one's awareness of one's feelings and the feelings of others and the capacity to utilize this in directing one's behaviors.

Being emotionally intelligent is not enough; there is need for everyone to be scientifically literate. The basic understanding of science that should be possessed by everyone, not only professionals in scientific and physical fields are frequently referred to as scientific literacy. Scientific literacy is the knowledge and understanding of scientific concepts and processes required for personal decision-making, participation in civic and cultural affairs, and economic productivity (Erinosh, 2004; Klopfer, 1995). Without this literacy in science, people are likely to be confused by many events that happen in the world and less likely to enjoy healthy and secured lives.

In addition to being emotionally intelligent and scientifically literate, successful living entails ability to tackle problems. Problem-solving is considered one of the most complex of all intellectual functions. Problem-solving has been defined as a higher order cognitive process that requires the modulation and control of more routine or fundamental skills (Mayer, 1992; Schooler, Ohlsson, and Brooks, 1993). The nature of human problem-solving methods has been studied by psychologists over the past hundred years. Problem-solving is a mental process that includes problem-shaping and tasking of our mental processes for solutions

(Fogler and LeBlanc, 2007). Problem-solving requires the modulation and control of more routine or fundamental skills. There is the need to tackle some difficult issues in life; marital, financial, social, medical, career, organizational by applying problem-solving techniques and basic knowledge of science.

## **UNDERSTANDING EMOTIONAL INTELLIGENCE**

Mayer and Salovey (1990) defined emotional intelligence as the subset of social intelligence that involves the ability to monitor one's own and other people's feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions. They further explained that emotional intelligence is a set of skills hypothesized to contribute to the accurate appraisal and expression of emotion in oneself and in others; the effective regulation of emotion in self and others. It is necessary to mention here that Jack Mayer and Peter Salovey are the leading researchers on emotional intelligence since 1990.

In 1997, Mayer and Salovey gave another definition that outlined the four branches of Emotional Intelligence. Mayer and Salovey (1997) explained that emotional intelligence has four branches namely:

1. Perception, appraisal and expression of emotion
2. Emotional facilitation of thinking
3. Understanding and analyzing emotions; employing emotional knowledge
4. Reflective regulation of emotions to promote emotional and intellectual growth.

A commendable thing about this outline of branches of emotional intelligence is that each of them can be measured by generating items on a questionnaire. Also, they are arranged from more basic psychological processes to higher, more psychological integrated processes. For example the lowest level branch concerns the relatively simple abilities of perceiving and expressing emotion, while the highest level branch concerns the conscious, reflective regulation of emotions. Emotional intelligence is the ability to perceive emotion, integrate emotion to facilitate thought,

understand emotions and also regulate emotions to promote personal growth (Cherniss, Goleman, Emmerling, Cowan and Adler, 1998; Cherniss, 2000). Salovey and Grewal (2005) gave a model that includes four types of abilities:

1. Perceiving emotions – the ability and decipher emotion in faces, pictures, voices and cultural artifacts including the ability to identify one's own emotions. Perceiving emotions represents a basic aspect of emotional intelligence, as it makes all other processing of emotional information possible.
2. Using emotions – the ability to harness emotions to facilitate various cognitive activities, such as thinking and problem-solving. The emotionally intelligent person can capitalize fully upon his or her changing moods in order to best fit the task at hand.
3. Understanding emotion – the ability to comprehend emotional language and to appreciate complicated relationships among emotions. For example, understanding emotion encompasses the ability to be sensitive to slight variations between emotions and the ability to recognize and describe how emotions evolve over time.
4. Managing emotions – the ability to regulate emotions in both ourselves and in others. Therefore, the emotionally intelligent person can harness emotions, even negative ones, and manage them to achieve intended goals.

However, Goleman (1998) focused on emotional intelligence as a wide array of competences and skills that define leadership performance. Goleman model outlines four main emotional intelligence constructs:

1. Self-awareness – the ability to read one's emotions and recognize their impact while using feelings to guide decisions.
2. Self-management – involves controlling one's emotions and impulses and adapting to changing circumstances.
3. Social awareness – the ability to sense, understand and react to other people's

emotion while comprehending social networks.

4. Relationship management – the ability to inspire, influence and develop others while managing conflict.

There are many other definitions and explanations of emotional intelligence. However, one of the areas of controversies is whether everybody has an innate ability for EI or whether EI is acquired. Goleman (1998) and Boyatzis, Goleman and Rhee (2000) posited that individuals are born with general emotional intelligence competences.

Hein (2007) emphasized that EI starts with the innate ability and that an individual ability to do all the components of EI later in life depends on both the innate potential and one's life experiences. He defined EI as the innate potential to feel, use, communicate, recognize, remember, describe, identify, learn from, manage, understand and explain emotions.

There are still many other definitions of EI however, the purpose of this sub-topic is not to critique definitions but to enable the readers understand the basic concept of EI so as to harness the power in it for successful living.

It is important to discuss Bar-On Model because it provides appropriate link between EI and various social concepts like problem-solving that are considered important for successful living. The literature reveals various attempts to combine the emotional and social components of EI. For example, Gardner (1983) explained that the conceptualization of *personal intelligences* is based on *intrapersonal* (emotional) *intelligence* and *interpersonal* (social) *intelligence*.

Additionally, Saarni (1990) described *emotional competence* as including eight interrelated emotional and social skills. Furthermore, Bar-On at different times have shown that *emotional-social intelligence* is composed of a number of intrapersonal and interpersonal competencies, skills and facilitators that combine to determine effective human behavior (Bar-On, 1988, 1997, 2000). Based on the above, it is more accurate to refer to this construct as “emotional-social intelligence” rather than “emotional intelligence” or “social intelligence” according to Bar-On's various submissions.

The Bar-On model provides the theoretical basis for the Emotional Quotient Inventory (EQ-i), which was originally developed to assess various aspects of this construct as well as to examine its conceptualization. According to this model, *emotional-social intelligence is a cross-section of interrelated emotional and social competencies, skills and facilitators that determine how effectively we understand and express ourselves, understand others and relate with them, and cope with daily demands*. Bar-On model reveals that older people are more emotionally and socially intelligent than younger people, females are more aware of emotions than males while the latter are more adept at managing emotions than the former, and that there are no significant differences in emotional-social intelligence between the various ethnic groups that have been examined in North America.

The results of data analysis clearly suggested a 15-factor structure, which is both empirically feasible and theoretically acceptable. In the order of their extraction, the first ten of the 15 factors that emerged are:

1. Self-Regard,
2. Interpersonal Relationship,
3. Impulse Control,
4. Problem-Solving,
5. Emotional Self-Awareness,
6. Flexibility,
7. Reality-Testing,
8. Stress Tolerance,
9. Assertiveness, and
10. Empathy.

These ten factors appear to be the key components of ESI. The other five factors are: Optimism, Self-Actualization, Happiness, Independence, and Social Responsibility (Bar-On, 2006).

In various publications, Bar-On have described 20 predictive validity studies to date that have been conducted on a total of 22,971 individuals who completed the EQ-i in seven countries around the world (Bar-On, 2006; Petrides and Furnham, 2001).

These publications shed a great deal of light on the predictive validity of the EQ-i by examining its ability to predict performance in social interactions, at school and in the workplace as well as its impact on physical health, psychological health, self-actualization and

subjective well-being (Bar-On, 1997, 2001, 2003, 2004, 2006; Bar-On, et al., 2005; Krivoy *et al.*, 2000). Based on these findings, the average predictive validity coefficient is .59, which suggests that the Bar-On model is indeed able to predict various aspects of human performance including problem-solving skills. Fortunately, the Bar-On model is teachable and learnable.

Soviet-born British psychologist Konstantin Vasily Petrides proposed a conceptual distinction between the ability-based model and trait-based model of EI and has been developing the latter over many years (Petrides and Furnham, 2000; Petrides and Furnham, 2001; Petrides, Pita, Kokkinaki, 2007). Traits of EI are "a constellation of emotional self-perceptions located at the lower levels of personality" (Petrides, Pita, Kokkinaki, 2007). In lay terms, trait EI refers to an individual's self-perceptions of their emotional abilities. This definition of EI encompasses behavioral dispositions and self-perceived abilities and is measured by self-report as opposed to the ability-based model which refers to actual abilities (Petrides, Pita, Kokkinaki, 2007) which have proven highly resistant to scientific measurement.

Petrides and Furnham (2001) conducted a psychometric investigation of trait emotional intelligence with some established trait taxonomies. They reported that traits EI correlated negatively with neuroticism (-0.29) and positively with extraversion and conscientiousness (0.30 and 0.35 with respectivity) while it was weakly correlated with openness (0.13) and negative agreeableness (-0.01).

## **EMOTIONAL INTELLIGENCE AND LIFE PROBLEMS**

Emotions are powerful; they can override thoughts, transform relationships and profoundly influence behavior. Emotional intelligence allows an individual to harness the power to understand himself/herself, overcome challenges, and building strong relationships. Above all, emotional intelligence can be learned at any time. Emotional intelligence is essentially the ability to recognize, manage and use your emotions in positive and constructive ways (Smith, Segal and Segal, 2011). It is also about recognizing the emotional states of others and engaging them in a way that feel good to all and create mutual safety, trust

and confidence. Research shows that intellectual intelligence has less to do with success in life than emotional intelligence (Bar-On, 2006; Petrides and Furnham, 2001). Intellectual intelligence helps us to understand and navigate the world on one level, but emotional intelligence helps to succeed in life. That is why some people that are academically brilliant are socially inept and unsuccessful (Bechara, Tranel, and Damasio, 2000; Boyatzis and Sala, 2004). The missing link in such people is the low level of emotional intelligence. The difference between success and failure in life is less a product of what happens to you than how you react to unexpected, unpleasant and threatening experiences.

Emotional intelligence is directly linked to self-esteem, self-awareness, compassion, empathy and adaptability which are important predictors of success in life. Emotional intelligence is what helps you to communicate clearly, lead others and build powerful relationships at work and in your personal life. Emotional intelligence also helps you motivate yourself, solve problems and achieve your goals (Bar-On, 2006; Reiff, Hatzes, Bramel, Gibbon, 2001). However, emotional intelligence does not necessarily guarantee or protect from life's tragedies, frustration or disappointments. Emotionally intelligent individuals go through bad times and experience sadness, anger and fear just like any other person, but they respond more positively than less emotionally healthy people to these experiences. Emotional intelligence gives you the ability to cope and bounce back from stress, trauma and loss (Freedman, 2003).

A cursory look at the branches or components of emotional intelligence shows a direct link between EI, problem-solving skill and success in life. One of the components of EI is problem-solving according to Bar-On (2006). The world is full of problems. Nations have problems and challenges. Individuals have problems and challenges. National problems may include civil war, political stalemate, recovery from natural disasters social vices, terrorism, religious crises to mention a few. Individual citizens also have their personal problems. These individual citizens make up a nation. If the problems of individual citizens are solved, reduced or ameliorated by harnessing the power of emotional intelligence, the nation will be better for it.

Personal problems can be deviant behavior, low academic achievement (Petrides, Frederickson and Furnham, 2004), marital (such as divorce, delinquent children, bitterness and hatred, in-law interference, adultery), social (such as drug abuse, maladjustment problem, prostitution, addiction and socialization problem), financial (such as unemployment, un-development, unsettled bills, debt and bankruptcy), medical (such as stress, terminal diseases, obesity, smoking and deformity or disability) career/profession (such as failure, lack of promotion and memory failure ) and many others.

It is important to devise ways of removing or coping with life's problems. Successful living does not mean lack of problems but ability to subdue or manage problems while still advancing on the ladder of progress (Freedman, 2003; Brackett and Mayer, 2004). The fact that EI is one of the factors affecting success in life is now widely accepted. World Health Organization listed ten skills that are required for success in life which include self-awareness, empathy and inter personal relations. These are traits of high EI therefore; EI can contribute to life skills.

People often mistake Intelligent Quotients (IQ) with emotional intelligence. Intelligent Quotient has to do with person's memory, reasoning ability and fluency with language and mathematical ability while EI is linked with a person's moods, attitudes, empathy and motivation. These are powerful forces that can result in an individual's success in business or social settings. Office Information Tips (2009) explained that IQ only contributes about 20% of the factors that determine a person's success while EI contributes about 80 %. A person with a high IQ has wide intellectual capacity and range of interest, confidence and fluency in expressing thoughts and opinions, a tendency to be anxious and to worry and a critical nature.

On the other hand, a person with high emotional intelligence have empathy for others, express their feelings directly, poised, cheerful and have a capacity to develop relationships. This is not to say IQ is not important, however to be successful in life, it is important to improve the emotional aspect of life. Many people who are successful in life (financially, martially, professionally and health-wise) are not necessarily people with high IQ because those who understand their emotions and feelings are able to make informed and better

decisions (Salovey, Mayer, Goldman, Turvey and Palfai, 1995; Martinez – Pons, 1997).

## **SCIENTIFIC LITERACY AND SUCCESSFUL LIVING**

The basic understanding of science that should be possessed by everyone, not only professionals in scientific and physical fields are frequently referred to as scientific literacy (Klopfer, 1995). The development of scientific literacy is a central concern of science education in all its ramifications. Knowledge of scientific concepts can be gained in formal instructions given students in secondary schools and tertiary institutions and also in the less formal teaching that takes place in science museums and science-technology centers.

Scientific literacy is the knowledge and understanding of scientific concepts and processes required for personal decision-making, participation in civic and cultural affairs, and economic productivity (National Research Council, 1996). Scientific literacy is considered to be composed of five basic components:

1. Knowledge of significant science facts, concepts, principles and theories.
2. Ability to apply relevant knowledge in everyday life;
3. Ability to utilize the processes of scientific inquiry;
4. An understanding of general ideas about the characteristics of science and the important interactions of science, technology and society;
5. The possession of informed attitudes and interest related to science.

Science educators (Erinosho, 2004; Ivowi, 1990; Klopfer, 1995) are of the opinion that when people's understanding and skills expressed in these components are fully developed, learners can function successfully in a contemporary technology-based society. Without this literacy in science, people are likely to be confused by many events that happen in the world and less likely to enjoy healthy and secured lives. The goal of any society therefore should be to develop as well as encourage scientific literacy among her citizens. It



is only when significant percentage of a nation's citizens is scientifically literate that science can be used as the vehicle for development. It is also by strengthening the scientific skills of the citizens that they will be empowered to solve myriad problems that confound the nation in agriculture, health, environmental management and disease control.

Moreover, it is becoming more evident that for any nation to keep pace with the global technological advances, she must develop a mass of people that understand science and can effectively use the knowledge. Therefore, through scientific enterprise, innovations and invention would emerge that could translate into practical terms through technological breakthrough for the advancement of humans (Olatoye, 2002). This is very important to fully realize the objectives of science education, which include production of a scientifically literate society. Facts and figures on mass and scientific literacy programmes should give all education stakeholders vision to project into the future.

There are three types of scientific literacy. Shem (1975) emphasized practical and civic aspects of scientific literacy. Practical literacy include information on such aspects of life like shelter, diet, child rearing, water and food supply. Civic scientific literacy enables citizens to contribute to debates about a range of science-related issues on public policy (e.g. fluoridation of drinking water, nuclear power or contraception). Scientific literacy is therefore concerned with health, recreation, safety at work, domestic energy management, and so on.

Olatoye and Oyundoyin (2001) and Olatoye (2008) asserted that scientific literate citizens should be able to provide scientific explanation to many events happening around them. This is very important because some cultural beliefs are antagonistic to scientific proofs and this affects the students even in the science class. Being emotionally intelligent alone without understanding of some basic concepts in science can make a person look like an illiterate. Scientific literacy should be able to provide answers to some frequently asked questions. Olatoye (2002) asserted that it is important for every citizen claiming to be literate and well-informed in the society to have basic understanding of the following scientific concepts even if he is not a scientist or in a science-related field.

1. Sex education and reproductive health: Basic diagrams of the male and female reproductive systems, natural family planning method, etc.
2. Food and nutrition: Classes of food, balanced diet, etc.
3. Basic units of measurement and conversion: Centimeters, meters, miles, kilometers
4. Pollution and environmental management: Oil spillage, climate change, greenhouse effect, etc.
5. Microbial activities and rules of hygiene
6. Shape of the earth, longitude, latitude, GMT, time zones in the world
7. Water treatment techniques
8. Genetic concepts in marriage: Sickle cell inheritance, blood groups
9. Causes and effects of some common diseases like malaria, cancer, polio, AIDS and tuberculosis.
10. Basic functions and diseases associated with different organs in the body of human beings. Organs include kidneys, lungs, liver and heart.

Now, rate your basic knowledge on each of the basic scientific topics listed above, assuming each topic carries 10 marks. If you are below average, you do not need to go back to secondary school to study science or change your course of study. No matter your score, you can still improve. There are easy-to-read textbooks on these basic topics. There are many people who are not graduates of science or science-related fields but have these basic knowledge of science that help them to make informed decisions and provide scientific explanations to events around us. A person with good knowledge of these concepts is likely to have good scientific attitude like curiosity and objectivity instead of providing explanations to events based on cultural practices and superstition.

Many people give different explanations for the appearance of rainbow in the sky. Science

teachers in literacy classes should be able to explain the concept of refraction. This can be demonstrated and illustrated (Lee and Fraser, 2001; Lynch and Livingstone, 2001). Water can be poured into a transparent container, a stick can be dipped inside it. The stick will appear bent at the surface of the water. This can be used to teach real and apparent depths in refraction of light rays. Light rays passing through a prism being refracted and breaking the light rays into different colors can also be demonstrated. When these simple experiments are carried out, then the scientific explanation for the appearance of rainbow can then be given. Rainbow occurs when it has just rained and there are droplets of water in the atmosphere. The sun appears, producing light rays which pass through the water droplets and then refracted into the sky breaking into different colors otherwise known as rainbow (Lynch and Livingstone, 2001).

One of the reasons for scientific literacy is to enable learner make informed decision. The transfer of sickle cell genotype can also be illustrated. This will help them to make informed decision about who to marry and or to counsel intending couples. The likely offspring (or children) that can emerge when people of different genotypic groups marry each other can be explained and illustrated (Hebbel, 2008). For example, if an AS father (carrier) marries another AS mother (also a carrier), the probability that they will give birth to a sickler is  $\frac{1}{4}$ . If this group of people are already married and are fortunate to have two children who are not sicklers they should be advised to stop giving birth to children. The illustration is presented in the box below:

		Father (AS)	
		A	S
Mother(AS)	A	AA Normal	AS Carrier
	S	AS carrier	SS Sickler

Many other experiments and illustrations can be given. For example experiments to show the percentage of oxygen in the air and relative density of liquids will make students in scientific literacy class to understand why ordinary water cannot be used to put off fire from petrol. Inculcating scientific literacy into the functional literacy class will not only make students to be able to read and write but to also provide scientific explanation to events happening around

them so that they can function effectively in the society rather than being victims of superstition and taboos. Some people today do not believe in the existence of Acquired Immuno Deficiency Syndrome (AIDS) because they cannot just imagine the world of the 'invisible', which is the world of micro-organisms (Valerio and Bundy, 2004; William, Milligam and Odemwinge, 1997). They ask 'How can something one cannot even see then be so strong to kill just by their presence on a syringe or needle?' Scientific literacy no doubt will help in eradication of communicable and even non-communicable diseases. An individual is not completely literate (though may be highly emotionally intelligent) until scientifically literate.

### SCIENTIFIC ATTITUDES CAN BE IMBIBED FOR GOOD LIVING

Scientific attitude is the ability to react consistently, rationally and objectively in certain ways to a novel or problematic situation. It is the ability to do things in a way that rely on proven principles rather than unverified principles. A person with good scientific attitude is free from superstition, unverified assumptions and many times from popular opinion that has no empirical basis (Olatoye, 2002; Klopfer, 1995). A person with scientific attitude is not necessarily a scientist, but he or she consciously or unconsciously thinks, acts and demonstrates traits that are common among scientists. The person expresses habits or tendencies which include open-mindedness, accuracy, suspended judgment, critical-mindedness, honesty and investigating true cause and effect relationships.

Webber (2011) explained the attitudes that scientists manifest when engaged in an inquiry or investigations. They are:

1. Beliefs: a scientist believes that everything that happens in this world has a cause or reason.
2. Curiosity: a scientist shows interests and pays particular attention to objects or events. He asks questions and seeks answers.
3. Objectivity: a scientist is objective and does not allow his feelings and bias to influence his recordings or observations,

- interpretation of data and formulation of conclusion.
4. Inventiveness: a scientist can generate new and original ideas.
  5. Open mindedness: a scientist listens to and respects the ideas of others. He accepts criticism and changes his mind if reliable evidence contradicts his belief.
  6. Critical-mindedness: a scientist bases suggestions and conclusion on evidences. When in doubts, he questions the veracity of a statement in relation to the evidences presented.
  7. Risk-taking: a scientist expresses his opinions and tries new ideas even at the risk of failure or criticism.
  8. Intellectual honesty: a scientist gives the truthful report of observations. He does not withhold important information just to please himself or others.
  9. Humility: a scientist is humble when he admits that he is not free from committing errors. There may be better ideas and individual who may be consulted to arrive at correct observations and conclusions.
  10. Responsibility: a scientist actively participates in a task and also dutifully performs tasks assigned to him.

It should be mentioned again that though these scientific attitudes are qualities possessed by good scientists, they can help in solving life's problems. Scientific attitude should therefore be taught to all students irrespective of whether the course of study is science or non-science based. No doubt, anybody, that poses these qualities are not likely to be victims of superstition and taboos. These qualities can make an individual to live a satisfied and fulfilled life.

### **APPLICATION OF PROBLEM-SOLVING TECHNIQUES IN SCIENCE FOR SUCCESSFUL LIVING**

In addressing problem-solving skills in science in this write-up, we do not intend to drag readers into the study of pure science. The point being made here is that there are ways scientists solve problems which if applied to social problems can

probably lead an individual to get solution to life's problems. Essentially, problem-solving is the essence of scientific investigations. Students are given a problem; they follow the guidelines of problem-based learning to solve the problem. Problem-solving in science is typically referred to as the scientific habit of mind which according to Wetzel (2008) include:

1. Asking questions based on observations and prior knowledge and experience.
2. Constructing hypotheses to guide an investigation.
3. Designing and conducting a science investigations.
4. Repeated Trials – conducting an investigation several times to average the data and determine the legitimacy of the data.
5. Accurate Records – keeping accurate data for all observations and investigations.
6. Drawing Conclusions – based on scientific investigation, prior knowledge and experiences.
7. Using data to develop reasonable explanation of scientific investigation.
8. Realizing that different conclusions can be drawn from the same set of data and are still correct.

Harnessing the power of problem-solving in science therefore means following the steps or scientific habits of mind listed above to arrive at solution to some challenges or problems in life. Take problem of unemployment for example. Following the steps above can help an individual having problem find solution. May be I can call this social applications of scientific principles. Let us consider the first two steps above:

1. Asking questions based on observation and prior knowledge and experience. What can I do to be engaged? What services are needed in this environment that I can provide? Who can I contact to help me out? The questions are many.



2. Constructing hypotheses to guide an investigation. Hypothesis simply means assumptions, realistic, positive and simple assumption should be made. This stage requires visions, boldness and clarity of purpose. A simple proposal in the mind, and creative mental ability to perceive likely problems and breakthrough. Theoretically, proposing workable ideas in the mind or on paper. List possibilities while still planning.
4. **Divide and Conquer:** breaking down a large, complex problem into smaller, solvable problems.
5. **Hypothesis testing:** assuming a possible explanation to the problem and trying to prove or disprove the assumption.
6. **Lateral thinking:** approaching solutions indirectly and creatively.
7. **Means-ends analysis:** choosing an action at each step to move closer to the goal.

## GENERAL PROBLEM-SOLVING TECHNIQUES

Problem-solving is a mental process that includes problem-finding and problem-shaping and tasking of the mind to get solution to problems. Considered as a complex intellectual function, problem-solving has been defined as a higher order cognitive process that requires the modulation and control of more routine or fundamental skills (Amsel, Langer and Loutzenhiser, 1991). The nature of human problem-solving methods has been studied by psychologists over the past hundred years. There are several methods of solving problems, in clinical psychology, research have focused on role of emotions in problem-solving (D'Zurilla and Nezu, 1982), demonstrating that poor emotional control can disrupt focus on the target task and impede problem resolution (Rath, Langenbahn, Simon, Sherr and Driller, 2004).

Problem-solving techniques are applicable in diverse fields of study which include reading, writing, calculation, political decision-making, problem-solving for business, managerial problems-solving, lawyers' reasoning, computer skills, game playing, personal problem-solving and solving of social problems (Frensch and Funke, 1995; D'Zurilla and Nazu, 1982). Problem-solving techniques that have been identified are:

1. **Abstraction:** solving the problem in a model of the system before applying it to the real system.
2. **Analyses:** using a solution that solved an analogous (similar) problem.
3. **Brainstorming among groups of people:** suggesting a large number of solutions or ideas, combining and developing them until an optimum is formed.

8. **Method of focal objects:** synthesizing seemly non-matching characteristics of different objects into something new.
9. **Morphological analysis:** assessing the output and interactions of an entire system.
10. **Reduction:** transforming the problem into another problem for which solutions exist.
11. **Research:** employing existing ideas or adapting existing solutions to similar problems.
12. **Root cause analysis:** eliminating the root cause of the problem.
13. **Trial-and-error:** testing possible solution until the right one is found.

Many of these techniques are also in line with what many other authors suggested. Authors like Mayer (1992), Fogler and LeBlank (2007) also proffer strategies similar to those listed above for solving problems.

## PROBLEM-SOLVING HINTS AND WISDOM

In problem-solving, four basic steps are important: (i) Define the real problem, not the symptoms (ii) Generate alternatives and choices that can solve the problem (iii) Evaluate the alternatives and make selection and (iv) Implement solutions.

Harris (2002) gave the following hints on how to solve problems.

1. Take time to examine and explore the problem thoroughly before setting out in search of a solution. Often, to understand a problem is to solve it.

2. Breaking the problem into smaller parts often makes solving it much easier. Solve each part separately.
3. The resources for solving problems are immense and ubiquitous.
4. You can always do something.
5. A problem is not a punishment. It is an opportunity to increase the happiness of the world and show how powerful you really are.
6. The formulation of a problem determines the range of choices, the question you ask determines the answers you receive.
7. Be careful not to look for solution until you understand the problem, and be careful not to select a solution until you have a whole range of choices.
8. The initial statement of a problem often reflects a preconceived solution.
9. A wide range of choices (ideas, possible solutions) allows you to choose the best from many.
10. People work to implement their own ideas and solutions much more energetically than they work to implement other people's ideas and solutions.
11. Remember the critical importance of acceptance in solving problems. A solution that is technologically brilliant but socially stupid is not a good solution.
12. When the goal statement is clear but the present state is ambiguous, try working backwards.
13. Procrastinators finish last.
14. Denying a problem perpetuates it.
15. Solve the problem that really exists, not just the symptoms of a problem, not the problem you already have a solution for, not the problem you wish existed and not problem someone else thinks exists.

16. A maker follows a plan, a creator produces a plan. Create your own plan.
17. Creativity is the construction of new things out of old things through efforts and imagination.

In problem-solving, there is the need to gather problem, generate superior alternatives, choose and implement the best solution, evaluate what you learn, and use that knowledge to create even better outcomes. You are able to leverage your creative skills to find better solutions for virtually any technical problem (Schooler, Ohlsson and Brooks, 1993; Mayer, 1993; Fogler and LeBlanc, 2007). The area of psychology that studies the process involved in finding solution to problems is cognitive psychology.

### **STRATEGIES FOR IMPROVING EMOTIONAL HEALTH**

Emotional Intelligence enhances general emotion, not only to cope in our places of work or achieve material prosperity, but it also assists in having good mental health. People who are emotionally healthy are in control of their emotions and their behavior. They are able to handle life's inevitable challenges, build strong relationship, and lead productive, fulfilling lives such people are able to recover quickly when bad things happen to them.

According to Smith, Segal and Segal (2011), mental or emotional health refers to your overall psychological well-being. It includes the way you feel about yourself, the quality of your relationships, and your ability to manage your feelings and deal with difficulties. Good mental health is not just the absence of mental health problems. It is not even absence of mental illness, mental and emotional health refers to the presence of positive characteristics. People who are mentally and emotionally healthy have:

- A sense of contentment
- A zest for living and the ability to laugh and have fun
- The ability to deal with stress and bounce back from adversity
- A sense of meaning and purpose, in both their activities and their relationships
- The flexibility to learn new things and adapt to change
- A balance between work and play, also rest and activity

- The ability to build and maintain fulfilling relationships
- Self – confidence and high self – esteem

In literature, the following strategies or tips have been suggested to improve mental and emotional health:

- Get enough rest
- Learn about and practice good nutrition
- Exercise to relieve stress and lift your mood
- Limit alcohol and avoid cigarettes and other drugs
- Do things that positively impact on others
- Limit unhealthy mental habits like worrying
- Avoid negative thoughts like thought of suicide or death
- Put the negative things that happened to you in the past behind you (e.g., death of parents or other traumatic experience like war or hospitalization).

## THE ROLE OF EMOTIONAL INTELLIGENCE IN SUCCESSFUL LIVING

EI shows significant positive relationship with many positive outcomes, especially with life satisfaction. The relationship between emotional intelligence and life satisfaction remains significant even after controlling effects of personality traits and social skills (Taksic and Mohoric, 2006). EI traits are recognized in many different areas, like workplace, in clinical psychology, interpersonal skills and in learning and achievement. EI is a strong predictor of success in the workplace through its significant association with transformational leadership, ability to foster group cohesiveness, strengthen commitment to organization and permit self-esteem (Abraham, 2005). Emotionally intelligent individuals are assumed to be socially effective.

Schuttle *et al.* (2001) reported that emotional intelligence had a close link with interpersonal relations, self-monitoring, affectionate relationships and marital satisfaction. Persons with higher emotional intelligence have higher ability to express empathy. Empathy is an important component of EI. Self-monitoring is the ability to (a) Understand other people's emotions and behaviours, (b) Understand environmental contexts, and (c) Modify self-presentation in response to such understanding.

Emotion is very important in interpersonal communication and getting on well in life. Human beings are social in nature and therefore cannot live in isolation. Emotional intelligence helps us achieve our potential, and to fulfill our hearts' ambitions. The more we develop and refine our emotional intelligence through the right knowledge of basic scientific understanding and problem-solving skills, the more we can enjoy fulfilling relationships, make informed decisions, realize deepest longings, manage life's conflicts and create fair, peaceful and sustainable society.

Evidence from literature continues to suggest that people with high level of emotional intelligence have greater career success, foster greater personal relationship, have more effective leadership skills and healthier than those with low emotional intelligence. Furthermore, they are able to monitor and evaluate others' feelings, empathize with others and they also possess interpersonal skills (Mabekoje and Ogunyemi, 2003; Olatoye, Akintunde and Yakasai, 2010).

## CONCLUSION

It is necessary to emphasize that problem-solving is a mental process. Considered one of the most complex of all intellectual functions, problem-solving has been defined as a higher order cognitive process that requires the modulation and control of more routine or fundamental skills (Amsel, Langer and Loutzenhiser, 1991). The nature of human problem-solving methods has been studied by psychologists over the past hundred years. Everybody goes through disappointment, loss and change. These are normal parts of life which can cause sadness, anxiety and stress. The difference is that people who are emotionally strong have an ability to bounce back from adversity, trauma and stress. This ability is called resilience. People who are emotionally strong and stable are able to cope with difficult situations while still maintaining a positive look.

In order to enhance emotional intelligence which many studies have linked with successful living, it is important to have basic knowledge that can assist in running day-to-day activities as well as able to provide logical explanations to some experiences within us and as well as events taking place around us. This is why the basic knowledge of science is important. There is also the need to tackle some difficult issues; marital,

financial, social and medical, career, organizational by applying problem – solving techniques.

## RECOMMENDATIONS

The good news is that it is possible to learn emotional Intelligence (Bar-On, 2006). Emotional Intelligence involves a cluster of skills which include self-control, zeal, persistence and self-motivation. Every student/citizen must be taught the essentials of handling anger, managing conflicts, developing empathy, and controlling impulses (Cherniss, 2000). Teachers and Counselors should help children recognize and manage their emotions. Educators/Administrators should be models in caring and respectful interactions with students/employees. With increasing level of literacy worldwide, schools should design programs that would assist students in developing emotional intelligence, and to develop tolerance and acceptance of differences.

Similarly, basic knowledge of scientific concepts and problem-solving skills should be incorporated in the school curriculum. Every graduate of our school system, school have basic knowledge of sex education and reproductive health, food and nutrition as well as problem-solving skills that can help to tackle life inevitable problems and also make intelligent and informed decisions (Klopfer, 1995). This no doubt will help in reducing some negative occurrences in the society such as suicide, unemployment, conflicts in work organization, marital instability, mental health problems to mention a few.

It is necessary to find out empirical relationship among emotional intelligence, scientific literacy, problem-solving skills and successful living. In addressing this issue, there is however the challenge of instrumentation (Petrides and Furnham, 2001). Fortunately, these variables can be measured. With good validated instruments, it will be possible to provide the extent to which certain variables influence successful living and hence quality of life.

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