

**The Importance of Creative Thinking, Emotional Intelligence
and the Arts for Education in the 21st Century
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Abstract

There is currently a great deal of discussion in the United States regarding the role of academic institutions in preparing students for success in the 21st century. One possible theoretical approach is presented, based on the author's own research, utilizing the following concepts: a theory of "creative thinking" derived from developmental neurobiology, cognitive science and psychoanalytic theory; the concept of "emotional intelligence" as presented recently by Daniel Goleman; Howard Gardner's theory of "multiple intelligences"; and arts education. This paper presents a theoretical foundation for the future intellectual, moral, emotional, social and business success and fulfillment of today's students through curricular and pedagogical educational reform.

At the present time in the United States, there is much discussion regarding the role of academic institutions in preparing students for success in the 21st century, what the purpose and therefore the focus of education should be in light of our changing national and global culture and what role the arts should play (if any) in the ongoing development of a child's ability to think.

There is a pervasive point of view in the United States which is that training in the fine arts, i.e., music, dance, painting, sculpture, poetry and drama, are "extra-curricular" activities which at best are seen as "fun", recreational or a way to produce professional artists, and at worst are superfluous and therefore useless with regard to a child's basic education. This point of view

can be seen clearly through its effects on the budgets for the arts in schools which have been severely cut over the years, and particularly in the virtual elimination of music programs in most public schools. The purpose of this paper is to provide an argument against this point of view and to present a case for the necessity of curriculum-based arts education at all educational levels based on current neurological and psychological research.

It is my contention that training in the arts not only creates a sense of cultural heritage, appreciation and understanding of the arts or in some cases the development of a skill, but also many other cognitive skills of which the following are some examples: it allows a crucial venue for giving form to feeling through symbols, it provides a basis for metaphorical thinking, it stimulates both the right and left cerebral hemispheres and the connection between the two, it encourages creative thinking, it stimulates and develops the capacity to perceive patterns, and it generates the capacity for empathy.

Dr. Robert Root-Bernstein states in a commentary published in the Los Angeles Times on September 2, 1997 that "The arts, despite their reputation of being subjective, emotional, nonintellectual pursuits, make science and invention possible...Scientists and engineers need much more than the objective languages of logic and mathematics to be creative. They must learn to observe as acutely as artists and to visualize things in their minds as concretely. They must learn to recognize and invent patterns like composers or poets, to make models of their visions like sculptors and to manipulate the tools of their trade and "play" their high-tech instruments with the same virtuosity as musical performers".

The results of experience and training in the arts are many, among them are: some students may discover a love of an art and a gift to do it and become artists, some may become teachers, some may become patrons of the arts, some may become people who promote the arts through business, some may become technicians who support the artistic product and some may use their creativity in other ways - whether as a parent, an entrepreneur, a teacher, an active citizen or in any vocation.

Additionally, as stated by Bernstein in the above quoted article, training in the creative thinking process through the arts provides cognitive, imaginative, interpersonal and intrapersonal skills that can facilitate productivity, invention and creativity in any field.

The role that training and exposure to the arts play in education is totally dependent upon how one defines the goal of education. Is the goal of education to inspire children to think, question and to be able to determine through conscious judgment a course of action that includes their own well-being as well as the well-being of those they come into contact with, and to have the ability to apply self-discipline to whatever they choose as a career path, and to interact well with those with whom they work and choose to have in their personal life? Or is it to turn out young adults who are competent enough to enter the work force, are obedient to authority (or rebellious against it), have little or no interpersonal skills, as well as having little or no intrapersonal skills?

We have to ask ourselves, given the current system, what is the purpose of the curricular structure and what is the information being given to the teachers

of our nation's children? Additionally, we must address the following question: when we state to our children that if they complete their basic education within our current system they will have the capacity to be successful in life, are we telling them the truth?

Jerome Bruner points out, in his latest book The Culture of Education (1996) that:

"What has become increasingly clear in these debates is that education is not just about conventional school matters like curriculum or standards or testing. What we resolve to do in school only makes sense when considered in the broader context of what society intends to accomplish through its educational investment in the young. How one conceives of education, we have finally come to recognize, is a function of how one conceives of the culture and its aims, professed or otherwise" (pox).

According to Howard Gardner, (1991):

"...even when school appears to be successful, even when it elicits the performances for which it has apparently been designed, it typically fails to achieve its most important mission. ...investigations document that even students who have been well-trained and who exhibit all the overt signs of success - faithful attendance at good schools, high grades and high test scores, accolades from teachers - typically do not display an adequate understanding of the materials and concepts with which they have been working"(p.5).

Gardner (1991) echoing Bruner claims that schools "ought to seek to inculcate in their students the highest degree of understanding" which he defines as:

"a sufficient grasp of concepts, principles, or skills so that one can bring them to bear on new problems and situations, deciding in which way one's present competencies can suffice and in which ways one may require new skills and knowledge. An important symptom of an emerging understanding is the capacity to represent a problem in a number of different ways and to approach its solution from varied vantage points; a single, rigid representation is unlikely to suffice"(p.18, emphasis mine).

In addition he says:

" I call into question the desirability of performances that are merely rote, ritualized or conventional, and in so doing, I take issue with many traditional educators who call for "basic skills", "cultural literacy" or the mandating of standardized tests" (p.6).

In addition to the failures of the educational system to produce student's "understanding" as claimed by Gardner and Bruner, many educators now agree that it is not enough to equip graduates with the academic skills necessary to succeed as scholars and professionals. Some of the "non-academic" qualities that are being stated as essential for success in today's society are: integrity, being a team player, a sense of social responsibility and moral character.

Ernest Boyer, who was the president of The Carnegie Foundation for the Advancement of Teaching, argued in his 1994 article in the Journal of Higher Education that higher education must pay much more attention in preparing students to be responsible citizens.

The University of Denver's Chancellor, Daniel Ritchie, says "...in the future, it is going to take more than a professional education. It will take a sense of self and self-awareness to recognize the differences and similarities among various peoples and cultures" (1996, New York Times Magazine).

The development of the qualities mentioned above is not necessary only for success as a citizen - - they are increasingly becoming crucial for success in business. With the increasing role of technology in business, many of the skills that students have traditionally learned are being taken over by computers, (i.e., computational, linear and some analytical skills). Given the massive and ever increasing amounts of information available through technology, it is quickly becoming clear that the ability to select which data are important out

of those masses of information, the ability to creatively synthesize those data and the ability to use those pieces of information in a way conducive to a larger goal, will be crucial for future success in any business.

Moving into the 21st century, it is clear that the United States is the current leader in the phenomenon called the global marketplace and the international information society. Our future as an economic power rests in the hands of those in school today, and our success will depend upon not only on their accumulation of technical expertise in a given field, but also on their capacity for creative thinking.

Harvard Business School professor John Kao, in his 1996 book Jamming quotes several business executives on the subject:

"Leo Royer, executive director, Minnesota Mining and Manufacturing Company (3M), says,

"Either you'll learn to acquire and cultivate [creative people] or you'll be eaten alive."

Michael Fradette, manufacturing consultant, Deloitte & Touche, asserts,

"To make money in a disinflationary period takes real innovation and creativity at all levels of the corporation."

Lloyd Cotsen, CEO of Neutrogena Corporation, states that managing creativity is the essence of the CEO's job.

Lawrence Wilkinson, president of Global Business Network, feels that the ability to improvise will be the key business skill in the coming decade." (p.xv, xvi, xvii)

Kao also states that "This is the age of creativity because the subtext of global competition is increasingly about a nation's ability to mobilize its ideas, talents, and creative organizations. A company that ignores the global

creativity map is spurning an important set of strategic considerations"(1996, p.16).

In addition to creative thinking, the ability to work as part of a team, to manage and pick teams well, to make appropriate hiring choices, to communicate effectively and to read people effectively are emerging as critical social skills that are not usually part of a traditional business education and can make the difference in an increasingly competitive market between getting and keeping a job or not.

I have compiled a partial list of those skills, capacities and qualities that are being discussed as important:

- 1. The capacity for adaptability to change; flexibility**
- 2. The capacity for and skills in questioning and debate**
- 3. The ability to recognize and question assumptions**
- 4. The ability to tolerate different points of view**
- 5. The ability to work as part of a group toward a common goal**
- 6. The capacity for empathy; the ability to see both similarities and differences in other people and ideas and the ability to tolerate those differences**
- 7. A sense of self-respect and respect for others**
- 8. An internalized set of moral values**
- 9. The ability to learn from experience; criticism, mistakes, failures, as well as successes**
- 10. The acceptance and knowledge of one's own strengths, limitations and areas of weakness**

11. The ability to understand theoretical concepts in such a way that they can be taken from one area of knowledge and applied to other areas

It would be agreed upon by most that the above listed capacities, abilities, qualities and skills are important to develop in young people. Additionally, most people would agree that the skills and qualities necessary for success as a "responsible citizen" and those necessary for success in business are similar. However, most people would probably disagree as to the proper venues for the teaching of these capacities. While some people would argue that this is the province of parents in the family, others would argue that it is the province of religious training. On the other hand, given the reality of today's society it is clear that due to the lack of their own training or personal problems, many parents cannot or do not teach these abilities, or in many cases there is no intact or healthy family unit in which to teach such abilities. Additionally, in many cases there is no coherent religious training given to young people. There is also the added complexity of the problem of the variety of religious teachings and whether religious institutions actually teach and instill the capacities listed above.

It would appear that most people turn to our educational institutions to address these issues. The problem with this as a solution is that it clearly is not appropriate to lay all the responsibility for the lack of good parenting, the lack of coherent and healthy family units or the lack of religious education squarely on the shoulders of our schools. However, this does not change the fact that the question still needs to be addressed as to what exactly schools can do. Is it possible that the teaching of the skills and the inculcation of the

qualities and capacities listed above can be integrated into the already existing curriculum without schools taking on the job of parents or religion, and without compromising academic integrity? The challenge would be to help young people develop the technical skills necessary for the achievement of expertise in a given area of specialization, yet still finding ways to emphasize an interdisciplinary understanding that goes beyond (but includes) the kind of knowledge needed for success on standardized tests.

One possible answer to this question is based on the author's own research (Stevens, 1996), utilizing the following concepts: a theory of "creative thinking" derived from cognitive psychology, cognitive science and psychoanalytic theory, the concept of "emotional intelligence" as presented recently by Daniel Goleman (1994), Howard Gardner's (1983) theory of "multiple intelligences" and arts education.

Creative thinking is generally defined as intelligent, goal-directed attempts at finding novel solutions to more or less well-defined problems within a specified domain those results in a novel product. This definition can be expanded to include the ability to discern similarities as well as differences between two different objects, people or ideas, the ability to question assumptions, the ability to make analogies and metaphors and the capacity to tolerate ambiguity in order to learn or discover a new idea.

The process by which this occurs has been called the "Eureka" phenomenon, as originally explicated by the French mathematician Henri Poincare and was then codified into a four stage process by Graham Wallas (1954). These four stages are:

1. Preparation - work, discipline, learning one's field and the specifics of a given problem and so forth.

2. Incubation - putting aside conscious "work" on a problem and doing other things, letting the ideas "play" in one's own unconscious.

3. Illumination - the "aha!" discovery, synthesis of disparate elements in a new way to solve the problem.

4. Verification - testing the hypothesis or new idea and validating its accuracy.

The two most important steps for this discussion are #2 and #3, although #1 is essential for the entire process. What is happening in the incubation stage? A synthesis of many theories about this includes the following:

- A mental space is allowed in which the mind can play with ideas - combining and recombining in the imagination. This space allows combinations that the conscious mind might not allow because they don't "make sense"; they are "absurd" or "impossible" and so forth.

- This mental play involves making analogies and associations. J. P. Guilford (1967) calls this "divergent thinking"; Edward DeBono (1992) calls it "lateral thinking".

- In this stage different matrices of thought with their own internal logic which seem incompatible are bisociated and a new and novel idea occurs according to Arthur Koestler (1964).

- This stage demands a suspension of traditional modes of thought and reasoning, and a willingness to question ideas that are assumed to be "true".

- The illumination stage is the new combination of ideas - the bisociation of

previously incompatible matrices of thought. It could be an invention, a joke, a metaphor, a work of art, an idea or a theoretical discovery.

At the macro-level, this process can be seen as that described by Thomas Kuhn (1962) in his landmark book The Structure of Scientific Revolutions as a "paradigm shift", resulting in a new way for humanity to view the world (e.g. Einstein). At the micro-level, cognitive psychology refers to "breaking a mental set" (Amabile, 1990) allowing one to move out of one conceptual set and into a new one.

Jerome Bruner (1996) in his discussion of the purpose of education, talks about goals that are consistent with the idea of creative thinking:

"Educational encounters, to begin with, should result in understanding, not mere performance. Understanding consists in grasping the place of an idea or fact in some more general structure of knowledge...Acquired knowledge is most useful to a learner, moreover, when it is "discovered" through the learners own cognitive efforts, for it is related to and used in reference to what is known before" (p.xii).

In 1945, Jacques Hadamard, a distinguished French mathematician published a work entitled "The Mathematician's Mind" in which he discussed his introspections about his own creative process and included examples from other mathematicians which he interviewed about their particular methods of thinking. The most notable resposdee (aside from his notoriety) was Einstein who was beautifully articulate about his own process. He said the following:

"The words or the language, as they are written or spoken, do not seem to play any role in my mechanism of thought. The psychical entities which seem to serve as elements of thought are certain signs and more or less clear images which can be 'voluntarily' reproduced and combined. There is, of course, a certain connection between those elements and relevant logical concepts. It is also clear that the desire to arrive finally at logically connected concepts is the emotional basis of this rather vague play with the above mentioned elements. But taken from a psychological viewpoint, this

combinatory play seems to be an essential feature in productive thought – before there is any connection with logical construction in words or other signs which can be communicated to others. The above mentioned elements are, in my case, of visual and some of muscular type. Conventional words or other signs have to be sought for laboriously only in a secondary stage, when the mentioned associative play is sufficiently established and can be reproduced at will (p.142 -143)".

As can be seen for the discussion thus far, the process of creative thinking seems to be an essential element in the skills and capacities discussed at the outset of this paper, i.e., flexibility, questioning assumptions, adaptability, seeing more than one side of an issue, perspective-taking, and the selecting, synthesizing and reassembling of information. However, if this idea is to be useful in terms of education, the question needs to be addressed as to what creates the capacity for creative thinking and particularly the ability to use both creative thinking skills and other intellectual abilities in a way that can lead students to both professional and personal success and fulfillment.

One answer, I believe, can be found in the relatively new concept of "emotional intelligence". "Emotional intelligence" has been popularized by Daniel Goleman in his 1994 book of the same name. It is a synthesis of work done by Howard Gardner of Harvard, some findings of neuroscientists - specifically Antonio Damasio as explicated in his 1994 book called Descartes' Error, and tangentially the work of attachment theorists and the British School of Object Relations.

Howard Gardner (1983) claims that humans don't just have one kind of intelligence as traditionally assumed and which can be assessed by standardized tests such as the Stanford-Binet IQ test. He states that we have several (seven) different kind of intelligences including; kinesthetic (physical),

musical, social or interpersonal, emotional or intrapersonal, logical-mathematical, linguistic and visual-spatial.

The intelligences that are usually the basis for a determination of overall intelligence are the linguistic and logical-mathematical. According to Gardner, the ignoring of the other intelligences as intelligences robs educators of the ability to appreciate and tap into an intelligence that may be the key to a child's way of thinking. In addition, this blindness could stop educators from being able to nurture and develop gifts that do not fall into the "normal" realm of intelligence testing and to actually stigmatize children who have other intelligences by labeling them as "not intelligent".

Antonio Damasio (1994) discovered in his work with patients who had prefrontal lobe damage that, while the patient's IQ and other cognitive abilities remained intact, the patients had tremendous difficulty making a decision. They could rattle off many possibilities regarding solutions to hypothetical problems, but they were incapable of discerning which was best or right or one that they would prefer and therefore they could not make a choice. Additionally, their emotions in general were dull and blunted. Based upon the neurological evidence from his research, Damasio claims that feelings are indispensable for rational decision-making. In other words, facts and other accumulated information are basically useless (except in specific isolated circumstances) unless a person has conscious knowledge of their emotions and the ability to tolerate and manage them.

This finding has had verification in recent works about the brain, among them, The Emotional Brain by Joseph LeDoux (1996). He states that, "We have

little direct control over our emotional reactions...while conscious control over emotions is weak, emotions can flood consciousness. This is so because the wiring of the brain at this point in our evolutionary history is such that connections from the emotional systems to the cognitive systems are stronger than connections from the cognitive systems to the emotional systems". (p.19)

In the field of psychoanalysis, the attachment theorists, such as John Bowlby (1969) have argued for the past 50 years that emotional development is crucial for the development of language and cognitive skills, as well as social skills. In addition, other psychoanalytic theorists, particularly those associated with the British School of Object Relations, (i.e., Melanie Klein, Donald Winnicott and Wilfred Bion) have developed elaborate theories based on clinical evidence as to the crucial part played by emotional development with regard to cognitive development.

Briefly, these psychoanalytic theorists (who all have theories of their own) have all emphasized in different ways the importance of the maternal care-giving person who can take in and tolerate the infant's needs in such a way that the infant is gradually able to separate from the "mother" (whoever that may be). In the space that is created by the mother, the child develops the capacity to think of the mother in her absence - the child develops the capacity for a mental re-presentation of the object. This space and the toleration of it by the child (as well as the parent) are the conditions which bring about thought and creative imagination. It is the ability to tolerate the emotional difficulty of separation between mother and child that creates the capacity for thinking oneself and about another and therefore the world of others.

In recent years, there are crucial findings from neurology that validate the psychoanalytic theories that were based upon clinical observation. Those findings are that early neuronal stimulation through emotional attachment (which involves physical and emotional connection, sound, music, rhythm and consistency) strengthens the neuronal connections between the different parts of the brain and between the brain and the sensory organs.

These attachments are most important between the ages of infancy and three years old, and secondarily between the ages of three and eleven. After that the brain operates on a "use it or lose it" dictum and discards that which has not been stimulated, whether it be the neuronal circuitry for joy or certain sounds. There are developmental "windows of opportunity" for language and emotions and behavior. One of the things we now know is that music reaches the very young and stimulates the brain which is one reason why sociobiologists think we as adults will "automatically" speak in "motherese" to infants and young children. "Motherese" is the sing-song, high-pitched speech adults use with children and it exists in all cultures.

Additionally, research from Colwyn Trevarthan, the Scottish researcher in infant development has shown that infants engaged in "dialogue" with their mothers or fathers tend to respond in an improvisational manner rather than a mirroring or imitation. He has shown in videotaped footage that the interchange between caregiver and infant tends to stay within a range of an octave below and an octave above middle C. He has also shown that the interchange tends to occur in bars of four. Mothers or fathers that go below or above that two-octave range tend to create states of either anxiety or

depression in infants. Also, if the rhythm is irregular that tends to create anxiety states in the infant.

The infant development researcher Allan Shore of UCLA has found that early attunement between the ages of birth and 1 and ½ affects the development of the right hemisphere. This is the part of the brain most sensitive to melody, rhythm, images and emotions. The “musical” attunement of the caregiver to the infant creates sensory-emotional categories that provide the basis for what will become abstraction with the advent of language. Additionally, it creates the beginnings of the capacity for self-regulation of emotional states which are crucial for attention, toleration of frustration and the ability to calm oneself among other things.

These theories are all relevant to Goleman’s concept of "emotional intelligence". Some of the capacities that it entails are the following:

- 1. The ability to motivate oneself.**
- 2. The ability to tolerate frustration and persist in the face of it.**
- 3. The ability to control impulses. (This implies an ability to read the Context of a situation appropriately)**
- 4. The ability to delay gratification and not need instant gratification.**
- 5. The ability to regulate one's moods.**
- 6. The ability to keep distress from swaying one's thinking.**
- 7. The ability to empathize.**
- 8. The ability to hope and see alternative possibilities.**

This emotional aptitude is a "meta-ability" in that it determines how well we use our other skills, including our intellect, technical facilities and information.

This is a theory that could also be called either "emotional management" or "emotional awareness" in that lack of access to emotions can be just as devastating to rational decision-making and problem-solving as too strong or overwhelming emotions that are out of control.

Emotional intelligence is essential to creative thinking in several important ways:

1. The discipline and motivation that it takes to learn and master the essentials of a given domain of inquiry demands the ability to tolerate frustration and ambiguity, as well as the ability to delay gratification.

2. The ability to put a problem aside and let it incubate without having an immediate solution also demands tolerance for frustration, ambiguity and delayed gratification.

3. The ability to withstand the upheaval caused by questioning belief systems and assumptions, demand the emotional abilities listed above as well.

4. Creative thinking is an essentially amoral cognitive skill that can serve any purpose as determined by one's own sense of moral and ethical behavior, as well as one's emotional needs whether conscious or unconscious. Therefore, emotional intelligence is crucial for the utilization of this skill in a healthy and productive way.

5. The ability to learn from and acknowledge mistakes, to accept failure and criticism without it affecting one's self-esteem or motivation and to continue to look for solutions demands the skills and capacities involved in emotional

intelligence.

As should be clear from the above discussion, emotional intelligence provides a basis for the kind of creative thinking and problem solving necessary in mastering a skill and developing the capacity for intellectual reasoning. In addition, the capacities enumerated as part of emotional intelligence allow creative thinking to be utilized in interpersonal relationships in the sense of facilitating the capacity for empathy, perspective-taking, putting aside one's own needs in the face of a greater situational need, the ability to "read" the context of a situation and the making of appropriate choices. In a situation where there is a disconnection between "rational" thinking and awareness of feelings, the result can be anything from intellectual or ideational rigidity to lack of empathy, insensitivity to others, lack of preference and values, failures in judgment and an inability to make decisions. On the other hand, if feelings are strong, unacknowledged and unmanaged, they can overwhelm rationality resulting in selfishness, inappropriate behavior, verbal cruelty, violence, impulse-driven decisions, biased and prejudicial thinking and/or behavior.

Emotional intelligence and creative thinking together can be seen as fundamental capacities which can create a state of balance which is at the same time paradoxically, a constant state of flux. The development and enhancement of these capacities in a person enable them to be able to adapt and adjust to changing realities, whether those realities are other people, ideas or environmental.

Therefore, effective decision-making and problem-solving skills depend

upon a combination of rationality, learned information; gut intuitive feelings and emotional wisdom learned from experience.

It is important to note that neither emotional intelligence nor creative thinking is positively correlated with IQ as assessed by standardized IQ tests currently in use. Additionally, while it is generally accepted that at least certain cognitive capacities that are associated with success on IQ tests are "hard-wired" in the sense of some genetic predisposition (although this is currently quite controversial), it certainly can be said that both emotional intelligence and creative thinking can be taught and learned.

As noted by Goleman (1994), while IQ tests, grades and SAT scores were designed and are still used to predict future performance, they have failed in terms of being able to accurately predict future success in life. He says that "at best IQ contributes about 20% to the factors that determine life success, which leaves 80% to other forces...the vast majority of one's ultimate niche in society is determined by non-IQ factors, ranging from social class to luck" (p.34).

In addition to positing the hypothesis that emotional intelligence is probably as important if not more important to future success in life than academic intelligence, it could also safely be hypothesized that an increase in emotional intelligence may lead to higher academic achievement.

This idea is beginning to be tested. Goleman (1994), for example, cites a longitudinal study begun by Walter Mischel in the 1960's at Stanford which illustrates the possibilities of this idea. A group of four-year olds were given

one marshmallow and were told that if they could wait until the experimenter got back from an errand, they would get two, but if they couldn't wait, they could have the one right away. Some grabbed the marshmallow right way, while others withstood the torment of temptation using a variety of methods such a singing, trying to go to sleep or playing games with their hands. These two groups were tracked through adolescence and the findings were that the group who had tolerated the frustration to get the larger reward at four was more socially competent than the others who had a more troubled psychological profile. In addition, the group who waited showed more academic success, motivation and ease in learning than the more impulse driven group.

The most dramatic results of the study concerned the relative SAT scores of the two groups upon finishing high school; the third of the children who had grabbed the marshmallow impulsively had a average verbal score of 524 and a quantitative score of 528, while the third who waited the longest had average scores of 610 and 652 respectively (large and significant differences).

The consequences of the failure of our academic institutions to include the development of emotional intelligence in the already existing curricula can be seen not only in the relatively low achievement scores of US students and the high drop-out rate, particularly in High School, but also in other areas of our society at the present time:

1. Lack of adaptability to change can result in rigidity, lack of ability to learn from experience (i.e., repetition of the same problems), and the lack of ability to adjust one's skills and thinking to new developments. This can result

in loss of business due to being stuck in an out-moded way of thinking, losing jobs or not being promoted, frustration and so forth.

2. Lack of empathy can lead to anything from insensitivity to cruelty, prejudice and racism. This then results in poor or bad parenting, interpersonal relationship problems at home and/or work, discrimination and so forth.

3. Lack of tolerance for frustration and delayed gratification, and lack of impulse control can lead to anxiety, stress, addictions, the lack of ability to learn and master a skill and at worst - violence.

4. Lack of connection with emotions or "emotional illiteracy" can lead to school drop-outs, delinquency, crime or violence on one extreme, and stagnation, mechanistic repetition and apathy on the other.

The ideas presented here can be instilled into already existing curricula of literature, social sciences, science, mathematics and the arts. One of the most clearly appropriate methods of teaching emotional intelligence and creative thinking is through arts education. In general, arts education tends to increase academic performance in all disciplines: ". . . research by the Centre for Arts in the Basic Curriculum indicates that when a school devotes more than 25% of its school day to the arts, students perform with academically superior abilities. . . students who study arts perform 30% better than those who do not" (cited in Maryland Alliance for the Arts, 1995). Ideally, arts education should integrate the application of experience in the arts beyond general "cultural enhancement" or actual skill building for future artists and performers.

Recent research validates the importance of early music education with regard to the development of higher neurological functions such as spatial-temporal reasoning. According to the work done by Frances Rausher, Gordon Shaw and Katherine Ky (1994), there was a significant improvement of spatial-temporal tasks by students after they had listened to a Mozart piano sonata. This study led to the much publicized “Mozart Effect”.

It is also important to note however, that those results from Rausher, et al, were short-lasting (5 minutes), not replicated by other researchers and not conclusive. With regard to standardized tests like the S.A.T., I agree with the editorial in the New York Times (March 1999) by Winner and Hetland of Harvard; it is not clear as to whether students perform better on standard exams who participate in the arts, or whether those who already do well academically have a proclivity toward the arts.

Ellen Winner and Lois Hetland have produced an exhaustive meta-analysis of the causal relationship between studying the arts and academic achievement which can be found in the Fall 2000 Journal of Aesthetic Education. Their meta-analysis included all of the available correlational and experimental studies in the U.S., the Netherlands and the U.K. from 1950 – 1998 on the subject. Their findings demonstrate that although there is a positive relationship between studying the arts and academic achievement, there is no evidence to date to show a causal relationship between arts study and verbal or math achievement. These findings are replicated by another large scale study done recently in Britain about arts education in secondary

schools by John Harland. The reasons for this include: 1) the nature of the studies themselves, as most of the experimental studies examined the effects of a year or two of study as opposed to the correlational studies which involved two or more years of study; 2) almost all of the studies measured multiple-choice test scores which by their nature are not appropriate for the arts as they call for right or wrong answers and convergent thinking, whereas the arts call for multiple interpretations and divergent thinking; 3) in order to transfer to occur (from one subject domain to another), teachers must teach explicitly TO transfer and none of the studies examined the effects of teaching to transfer. In addition, to posit transfer, one has to rule out multi-factoral considerations such as self-selection.

The study concludes by saying that just because no causal relationship can be found between arts education and academic achievement – it does not follow that the arts are not a necessary part of a curriculum of study. There were certainly positive effects found in the correlational studies. In addition, studies measuring motivation, self-concept as a learner in particular subjects, perception of school and community, and creative thinking have consistently shown high correlations with students participating in the arts.

Almost everyone will agree that experience in the arts enhances a child's (and adult's) experience and perception of the world. In addition, I will add that whether or not experience in the arts actually increases cognitive skills (which includes interpersonal skills and ethical thinking) remains to be seen. In the meantime, the key, in my view, has to do with how the arts are taught in conjunction with regular curricular studies. In other words, just listening to

Mozart for example, will in all probability not increase memory or visual-spatial skills. However, it can, if taught with an eye toward metaphor, analogy and problem-solving, and within the already existing curriculum.

What I am suggesting is a new way of teaching which emphasizes connections, links and patterns within disciplines and which includes the arts, an understanding of multiple intelligences and emotional intelligence which when combined with the basic information required at each grade level will show an increase in test scores and a decrease in depression, violence and self-destructive behavior in students. Experience in the visual arts, dance, theatre and music teaches students many things. Students learn how to access and give form to their emotions, they learn discipline and the tolerance of frustration through the acquiring of a skill, and they learn the importance of subsuming one's own personal desires and/or problems for the achievement of a group goal and the development of empathy. Students are given the opportunity to see the world through the eyes of another, to develop the ability to "play" with ideas, and learn that the ability to play and improvise is dependent upon the mastery of basic skills and information.

In addition, training in the arts gives new ways for students to understand themselves, others and the world in a variety of ways, utilizing all of the different kinds of "intelligences" outlined by Gardner. I would posit that it creates a kind of intelligence not enumerated by Gardner – which is called (by me) “aesthetic intelligence”. This kind of intelligence could also be called the “intelligence of the unconscious” insofar as it entails a development of a capacity to see and listen with the unconscious mind to patterns and

connections that may not fit assumed rational patterns and preconceptions. This kind of “unconscious scanning” (Ehrenzweig, 1966) is key to the creativity of both artists and scientists. It is also key to what we generally call “intuition” and “attunement”. This is as crucial in human relations as it is with regard to scientific or artistic innovation or invention.

Training in the arts also creates inter-cultural appreciation and understanding, which broadens student's view of reality, encourages and develops the ability to take other perspectives and thereby diminishes the possibility of racial or ethnic discrimination. Training in the arts encourages creative solutions to problems and teaches analytical skills that cross over into other disciplines and endeavors.

In short, the importance of arts education for the development of skills that are necessary for future success in business as well as personal life cannot be overstated:

"The US Labor Department report of the Secretary's Commission on Achieving Necessary Skills (SCANS) recently cited the important role of arts education in achieving many "core competencies" for the workplace, which include allocating resources, collaborating, acquiring and evaluation information and understanding social systems. The arts are cited as important for certain "foundation" skills which include thinking creatively, problem-solving, exercising individual responsibility, sociability and self-esteem" (cited in Maryland Alliance for the Arts, (1995) "The Arts and Children").

According to Howard Gardner (1973):

"In general, the most critical experience for the participant in the artistic process seems to be intensive experiences of all sorts with the symbolic medium - this procedure appears to lead to the natural growth, development, and integration of the perceiving, feeling, and making systems. This conclusion follows from our view of the arts as a natural developmental path for man...the arts may be viewed as a problem-solving process in which

the execution is emphasized; artistic development involves mastery of a symbolic medium"(p.92).

Finally, Gardner discusses the potential intellectual usefulness of arts education in reference to other areas of learning in the following way:

".. they [children] acquire various symbol systems, master the communicative potential of these systems, and gain an increasing sense of themselves and others and a feeling for artistic media, the insights they have acquired can be communicated to other persons...Their increased commerce with the world of other individuals, their refined knowledge of the tradition and codes, and their increasing skills with various making activities soon enable them to participate more fully in a range of symbolic forms"(p.349).

In addition to the teaching of general arts courses to all students from pre-school through the undergraduate level, the existing curricula in any field can be taught in a way that encourages and emphasizes creative thinking and emotional intelligence.

This includes emphasis on questions in class and on tests which demand creative and critical thinking skills for answers, exercises and projects that involve both the learning and mastering of material and the development of interpersonal skills, perspective-taking exercises, application of the information being learned to "real-life" situations, application of theoretical information and formulas to specific situations and other areas of knowledge.

I will add, however, that learning through the various fine arts can be instilled into the teaching of any subject at any level without the teacher having to be an expert in a particular art form.

To accomplish this requires teacher training which will empower teachers to develop their own abilities to think creatively and to acquire their own competencies to support emotional intelligence so that their personal

emotions or biases do not get in the way of effective teaching.

In conclusion, it has been stated that the contemporary educational system in the United States appears to be inadequate for the purpose of effectively preparing students for success in the 21st century. One possible solution has been presented involving the implementation of certain theoretical concepts of creative thinking and emotional intelligence (Stevens, 1996). It has been posited that these ideas can be inculcated into the already existing curriculum through changes in teaching style and methods of testing without altering the learning and mastery of the basic skills in a given domain of knowledge, and it has been stated that such training would actually enhance learning and performance in any domain. In addition, the importance of arts education for all students has been emphasized focusing on the most direct method of teaching the skills and capacities inherent in creative thinking and emotional intelligence.

Although the ideas that have been discussed are obviously not a panacea nor are they a complete solution to the major problems faced by educators and policy makers as they seek to prepare our students for the 21st century, the focus on the development of the skills enumerated in this paper could provide a foundation for the future intellectual, emotional, social and business success and fulfillment of today's students. The lack of the development of these skills and the elimination of the arts as basic to the development of these skills within our educational system could have serious negative consequences for the future of our society. These consequences could occur at the level of

artistic and scientific creative invention as well as at the level of social behavior. It is imperative that our society implement these findings or face a future unprepared to survive millennial change.

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