Five Minds for the Future
By Professor Howard Gardner - COPYRIGHT Howard Gardner 2008

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Introduction:

I am an admirer of the International Baccalaureate. I consider IBO the source of strength in education, because I believe the International Baccalaureate is more forward looking, more globally oriented, and less *faddish* than other educational enterprises.

Education is fundamentally about values, but we have a great deal of difficulty talking about values. In the United States now, we rarely teach Philosophy of Education or History of Education, because people would disagree too much. There is a local joke in the United States called the "Jesse Test": You could never, in the United States, come up with a curriculum that would please: Jesse Helms, a conservative Southern senator; Jesse Jackson, a fiery, African American leader; and Jesse Ventura the wrestler-turned governor of Minnesota. And therefore, we simply don't talk about values.

 The economist J.M. Keynes said that you can put down economists as much as you like, but whether we know it or not, we are all acting according to the theory of some long dead economist. I believe the same about education. People who have never heard of Rousseau, Hobbes, Kant, or Dewey, are living their educational philosophies, erroneously thinking it is their own philosophy.

I welcome the platform of this conference. My presentation is somewhere in between *must* and *should*. *Must* in the sense that the Five Minds are competencies which young people and the society need in the twenty first century going forward. My talk is also about *should* in the sense of my own values. If I were the Tsar of education worldwide, this is what I would prescribe. However, I remember what happened to the Tsar, and so I am more cautious.

I will begin with a disclaimer, then show some images of the future, and move to the heart of the talk which will be about the Five Minds that I am interested in. Finally I will mention the two most frequently asked questions/challenges to this conception. I hope there will be time for questions.

People who know my work in education think of me as the man who proposed seven, eight, or nine different intelligences. When I write about intelligence, I am trying to be a scientist. If we really understood human evolution in detail, we would see that the mind and the brain are composed of a number of relatively autonomous computing systems. For example, one system is for language, one for music, one for spatial cognition, etc. In talking about Five Minds I am of course interested in psychology, but I am really speaking from the perspective of policy. And in that sense, there are many other minds that I could have talked about. As the policy maker/Tsar, these are the minds that I would try to promote today and tomorrow.

Here are some images of the future: The **genetic revolution**: within all of our lifetimes, young people will go to school with gene chips which contain their entire genome and they'll say to teachers and administrators "these are the genes that are inactive, these are the ones that are working- teach me effectively!" and we will not be able to ignore that plea. More images of the future include: **Mega cities**, images and fashions that circulate around the world; **trillions of dollars** traded 24/7 each day; **machines** which do thinking, carry out tasks which used to be done by human beings; **virtual realities** like "Second Life".

A hundred years ago, most people didn't go to school, and those who did left school at twenty years old, confident that they would never have to be further educated. But nowadays as one biologist told me, if one doesn't keep up for three months one will never be able to catch up again. All of you know the speed with which knowledge accumulates in almost every sphere. Much of our education has to be self-education.

Here are some descriptions of changes which will impact educational thinking. Many people work on problems which cut across disciplines. They converge on a geographical area, work together in teams, build on one another's knowledge, then separate and maybe connect electronically, but maybe never work together again. Linear thinking doesn't end, but non-linear kinds of thinking, systemic thinking, and dynamic models are in the ascendancy. So much of "thinking within the box" can be done by automata, and so the capacity to be one step beyond computers takes on additional importance. Most of our students are already way ahead of us digitally whether we are teachers or parents, and

that raises interesting questions about what it is that they have to give to us and what it is that we have to give to them in terms of the educational dynamic.

The plan for the rest of the talk will be to describe the five minds. I will be concentrating more on the Synthesizing Mind and the Ethical Mind because I think that they are less familiar, and frankly, I find them more enigmatic and thus more energizing to explore.

The Five Minds:

The Disciplined Mind:

I was asked in the year 2000, "what was the greatest invention of the last two thousand years?" My answer was classical music. The real reason I gave that answer is because I wanted to be quoted, and I knew if I said something such as 'the wheel, the pill, or nuclear energy", many other people would have said the same thing and I might have been quoted. But, if I say classical music, I would have the prospect of being cited in a magazine.

A better answer, and an answer which I think we can all feel at home with, are the scholarly disciplines. I would include: Classical Music, Science, History, Economics, etc. Those of us in academia take these disciplines so much for granted, that we forget they are all human inventions. It took hundreds of years to invent Experimental Science, Classical Music, linear Perspective, and Calculus. And they might well never have been invented. Often, when tyrants come to power, they try to eliminate the disciplines and the

disciplinarians because they/we get in tyrant's way. Therefore, I believe that one needs to begin with disciplinary thinking.

When I use the term disciplinary thinking I am playing on three connotations of the English word *discipline*. Firstly, what our grand-parents knew -- you should work regularly and steadily on things and eventually you will get better. Indeed, any practice will build up disciplinary muscle.

The second—is the heart of what happens in middle and secondary school—is mastering the major ways of thinking. Before university, they are Science, History, Mathematics, and one or more art forms. I make a very sharp distinction between discipline (a powerful but typically non-intuitive way of thinking) and subject matter (facts, information).

The third connotation, which is so important if we want our children to be gainfully employed and have a full life is becoming an expert in at least one thing. Because if you are not an expert, you will not be able to work in the world of the future, or you will work for somebody else who is an expert. And that is so different from two hundred years ago during agricultural times and a hundred years ago during industrial times. Now, we are really in a knowledge era, and expertise is the only thing which will take forward real value.

Now, I just introduced a distinction between discipline and subject matter. In most schools, in most parts of the world, though probably not in your schools, we "do" subject matter. Subject matter means information and facts. Things like, "Which king followed which queen? What was the year that something happened? What's the atomic weight of lead? How many planets are there in the Solar System?" But that has nothing to do with disciplinary thinking. Disciplinary thinking is the deeply different ways in which scientists or historians or artists approach their daily work.

To illustrate this point, I'll compare Science and History. Scientists create models of the world; they try to explain the physical, biological, psychological worlds. They develop theories, they carry out experiments, or they do observations—and when those empirical works are carried out, the theories are revised in light of the outcome.

Historians on the other hand, try to figure out what happened in the past. They primarily use written documents, more recently graphic documents, and in some ways human beings are no different from how they were three thousand years ago. Historians have to understand the missions, fears, and purposes of human agency. But in other respects, over time and across cultures, people are very different. Historians always have to play with that antinomy.

 Finally, every generation has to rewrite history. If you are an American, when you write the history of the Roman Empire today, it is totally different than it was fifty years ago. Not because we know so much more about Rome, but because the United States today is

the Roman Empire, for good and for ill; <u>not</u> to think about that state of affairs is to be in outer space.

Those are the things which you can't just pass on to people. In contrast if I want to pass on a list of American presidents, I can carry that around in my hand and pass it on. And so disciplined thinking is very different from subject matter thinking. It is our responsibility to our middle and secondary schools to engender the disciplinary habits of mind of the major disciplines. Because otherwise, we won't be able to make sense of what is happening in our world in terms of current events and new discoveries—whether good or ill. This is what history has needed, and we won't be able to make decisions about health and about policy unless we have cultivated those ways of thinking. The more international comparisons (like the PISA rankings) focus on subject matter rather than on disciplinary thinking, the more anachronistic they will be.

No cigar. When I was a young boy we used to go to Carnivals and they would have Kewpie-dolls on a ledge. You would be given a ball and your job was to throw the ball and knock down a doll. If you got the doll you could keep it, but if you missed the barker would say "close, but no cigar". So, in each case of each of the minds I am going to talk about false or *faux* examples.

One example of the poorly disciplined mind is when people see everything through one discipline: economists who see the whole world through rational choice; psychologists who see the whole world through evolutionary psychology; the lawyer who sits down

with his children who are two and three years old and writes down a constitution which gives the children their rights and their responsibilities. That is hyper disciplinarity.

The second example comes from the life of Arthur Rubinstein. He was a world famous pianist. From the age of twenty, he gave concerts which had an enormous reception, but then he became lazy and he relied on pyro-techniques rather than careful practice. But, he came to realize that if he didn't practice for a day he knew it; if he didn't practice for a week the orchestra knew it; and if he didn't practice for a month, the audience knew it. Therefore, he stopped his wild and carousing ways and began to practice each day and essentially recovered his discipline. The lesson here is that you can think disciplinarily for a while but ultimately you have to keep up the disciplinary muscle if you want to be taken seriously by those 'in the know'.

The Synthesizing Mind:

I began to think about the Synthesizing Mind when the great physicist Murray Gell-Mann made an off handed remark. He opined that in the twenty-first century, the most important mind will be the synthesizing mind. A great example of a synthesizer is Charles Darwin. He travelled for five years aboard the Beagle, and collected a huge amount of information about the flora and fauna of the world. He did his own experiments and observations of the world, corresponded with everybody who was a naturalist, and then twenty years later put forth one of the great intellectual syntheses "On the Origin of the Species."

The Synthesizing Mind realizes that nowadays, we are all inundated with information. If you looked up the word "evolution" on your search engine, you could spend the rest of your life just reading secondary sources. Many of them are of questionable value and you need criteria for deciding what to pay attention to and what to ignore. Additionally, to synthesize for yourself, you have to put information together in ways which cohere, which make sense for you. And if you are involved in communication, as every teacher, parent, and professional is, the synthesis has to be transmittable to other people.

 I thought that psychology would have something to say about synthesizing because it is so important, but my research revealed that in fact psychology doesn't have much to say. Some of you are thinking: "well, isn't synthesizing what teachers have always done?" But let me introduce Monsieur Jourdain from the *Bourgeois Gentilhomme* by Molière. M. Jourdain got very excited in middle age because he found out that he was speaking prose all his life without realizing it. I think we have been in the business of synthesizing, but we haven't been aware of how important it is and how we might help other people to become better synthesizers.

 How one might be more reflective about synthesizing? The answer is: looking for the current best synthesis, deciding what our ultimate synthesis should look like, picking a method, deciding what are we going to look at, listen to and why, examining what are we going to ignore and why, and importantly, how are we going to record information, using equations, mind maps, stories, formulas, taxonomies, or whatever. Again, the kind of things that most of us do already, but we aren't really reflective about it, we don't spend

much time explicitly transmitting that lore to people who are less experienced in synthesizing. Life is short, syntheses are due, term papers are due, lectures are due, but you want to finish the proto-synthesis some time beforehand, so that you can get informed reactions. Not only from people who know a lot but also from people who don't know so much.

Finally, "no cigar" syntheses which try to do too much, which are too narrow, or which are eccentric are not adequate.

The Creative Mind:

The Creative Mind is embodied by Einstein in the Sciences and by Virginia Woolf in the Arts. People who are creative are those who come up with new things which eventually get accepted. If an idea or product is too easily accepted, it is not creative; if it is never accepted, it is just a false example. And acceptance can happen quickly or it can take a long time.

I believe that you cannot be creative unless you have mastered at least one discipline, art or craft. And cognitive science teaches us that on the average, it takes about ten years to master a craft. So, Mozart was writing great music when he was fifteen and sixteen, but that is because he started when he was four or five. Same story, with the prodigious Picasso. Creativity is always called "thinking outside the box." But I order my quintet of minds in the way that I do because you can't think outside of the box unless you have a box.

As a psychologist, I thought that creativity was mostly an issue of how good your mental computers were. But my own studies and those of others have convinced me of two other things. First, personality and temperament are at least as important as cognitive powers. People who are judged creative take chances, take risks, are not afraid to fall down, and pick themselves up, they say "what can I learn from this?" and they go on.

The other day I was giving a talk and the first question asked was "How do we make people creative"? And I answered that "It's much easier to prevent it than to make it". You prevent it by saying that there is only one right answer and by punishing the student if she offers the wrong answer. That never fosters creativity.

Second: People think of creativity as a property of the individual and therefore they say "I am creative", but that doesn't work. The only way that creativity can be judged is, if over the long run, the creators works change how other people think and behave. That is the only criterion for creativity. Therefore, the bad news is that you could die without knowing that you are creative, but the good news is that you will never know for sure that you are not creative. Because maybe after you die, people will make a big fuss about you and then, post-mortem, you will be creative. That's what happened to Emily Dickinson and Vincent van Gogh. We call that the judgment of the field.

 There are many examples of false, or *no cigar* creativity. In the eighteenth century people thought materials burned because of a substance called phlogiston, but it turns out

that there is no phlogiston. In the nineteenth century people thought that we all existed in something called the Ether but there is no Ether. In the twentieth century, people thought you could produce virtually infinite amounts of energy by passing some electric current through water, but cold fusion didn't work. And if you go through most best-selling books and most art shows, in ten or twenty years they will be forgotten. Consequently, there are alas a lot more examples of failed/*no cigar* creativity than there are of what Mihaly Csikszentmihalyi calls "Big C" creativity.

If I had given this talk ten years go, I would have stopped here, because my work as a cognitive psychologist has been about thinking, problem solving, and intelligence. Also, there is a natural progression from having a discipline, to being able to synthesize, to creating something new. But for the last dozen years, I have been working chiefly in the human sphere, relations of people in groups and to one another, and thus the last two kinds of minds deal with this human sphere. They are called the Respectful Mind and the Ethical Mind.

The Respectful Mind:

The Respectful Mind is quite easy to explain, but that doesn't mean it is easy to achieve. The Ethical Mind, as I think about it, is more complex. The respectful mind is no more or no less than what gave rise to the League of Nations and the United Nations. It is recognizing that the world is composed of people who look different, think differently, have different belief and value systems, and that we can no longer be hermits and live in

complete isolation. Therefore, our initial choices are to make war, (which is what we did in a tribal society), or to hold our nose and tolerate others. But we can be more ambitious.

We can try to understand better, make common cause with, and give the benefit of the doubt to other people. This process begins with birth. It is how the father, mother or care-taker treats the child; how parents treat one another, how siblings treat one another, etc. I can go to a school in the United States and I can determine within minutes whether there is a respectful atmosphere. You can observe it in the ordinary interactions between teachers, staff, kids and so on.

Here are some examples of *no cigar*: respect with too many conditions, mere tolerance, bad jokes (jokes at the expense of others), and then something which we are all becoming familiar with: *Kiss up* or *kick down*. Kiss up is when you flatter people who are more powerful than you, people that you want something from, and once that dynamic stops, you ignore or give them a kick. There are plenty of examples of disrespect anywhere.

There are promising examples of those who try to institute respect in the world: Commissions in peace and reconciliation which take formerly warring groups, the victims and victimizers, and try to arrive at an understanding which can include forgiveness. As a music lover, I am interested in those musical efforts, such as the Middle Eastern Orchestra (associated with Daniel Barenboim and Edward Said) and The Silk Road Project (associated with Yo-Yo Ma). These are efforts to get people from different societies and cultures to make music together to understand their relationship to music,

and to use this kind of "aesthetic ping pong" to break down barriers. And we need to be very much on the look out for whenever institutions and practices can enhance respect.

I actually changed my own mind as a result of this work on respect. Concerning the Danish cartoons that mocked Islam in 2005, my initial reaction as a civil libertarian was to think of free press; people should be able to say and draw what they want. But, I've changed my mind about that. I think it was a mistake to publish the cartoons. I wouldn't put anybody in jail and indeed with blogging nowadays you cannot prevent anybody from transmitting anything on the internet. But I make a distinction between the respectable press and the not respectable press. I think the respectable press should say what it wishes to say clearly—in plain natural language, be it Danish or English-- but not inflammatorily. And I think the Danish cartoons were unnecessarily inflammatory.

The Ethical Mind:

The Ethical Mind involves a higher level of abstraction. Being in the world involves a higher level of thinking. Because the Ethical Mind does not say, "how should Howard Gardner behave towards others?" But rather, it says, "I am a worker, in my case a teacher, writer, scientist and I am a citizen, in my case of my university, my community, my nation, the wider world—how should I behave?." Not in terms of what my rights are, but what are my responsibilities as a citizen, as a worker, within the school context, what are my responsibilities as a student and as a member of a school community? And of course it's great to know your responsibilities but it is not sufficient; to be sufficient you have to act on the basis of responsibility. Thus, the Ethical Mind reflects on different

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roles that we fulfil and talks about what are the proper ways to fulfil those roles and tries,

though not always successfully, but at least makes the effort, to fulfil those

responsibilities.

The work that I have done has been in collaboration with many scholars, particularly

William Damon and Mihaly Csikszentmihalyi. It is called "The Good Work" project. We

define good work as a work that embodies three Es: **excellence** in a technical way;

engagement—that people are meaningfully involved with what they are doing and they

find it motivating. They look forward to Monday and are even willing to come to the

meetings on Saturday! and **ethical,** behaving responsibly in your world as a worker. I

think of these three Es as a triple helix. And interestingly these three Es don't necessarily

coexist. You could be excellent but not ethical. You could be ethical but not engaged.

The challenge of good work is to intertwine those three Es. And we have carried out a

very large scale and careful project over twelve years, almost entirely in the United

States, trying to understand what makes for good work and how one carries out good

work at present. Things are changing very quickly, our whole sense of time and space is

being altered by technology, markets are very powerful, and especially in the United

States there are no forces able to mediate or moderate or modulate the markets. Therein

lies the challenge of good work.

My colleagues and I did a study of good work in young people from the ages of 15-35.

Wendy Fischman and others wrote a book called *Making Good: How do Young People*

Cope with Moral Dilemmas at Work and we found a very disturbing picture. I give you this picture although it may not exist in your country. But alas just as in the United States what starts in California ultimately tends to make its way across the country, often in the world what starts in the United States travels all too quickly elsewhere.

We found that the best and brightest, those young people who are the elite of your schools and are already winning awards, knew what good work was. Some of them tried to be excellent and ethical and engaged, but many of them told us that they could not afford to be ethical. Because, they said, it was very important for them to succeed, to have money, power, prestige, prominence. Since they were in competition with their peers, they suspected that their peers were cutting corners and they were not going to be upright, if that meant that they were going to lose to somebody who was less ethical. And so they told us that someday they would be ethical, that they would be the cream of their community, serve as a role model, support good causes, and hire ethical people. But they couldn't afford to do it now. We are reminded of what Saint Augustine said "Oh Lord, make me chaste, but not quite yet".

And that is what these young workers were telling us. They were not typically bad workers since they weren't doing things that were illegal, but they were doing compromised work. They were doing journalism and making things up, or taking things from the web and not verifying the source. They were doing science but not running the extra control or not sharing the data with people who share the data with them. They were compromising.

This finding has changed my life. I am now spending my time with people in secondary school and colleges. We are exposing young people to ethical dilemmas and having them think about them, as well as role playing, and essentially trying to make them carry out what we call meaningful work and a meaningful life. Not focussing so much on the next prize, but thinking in the long run what kinds of human beings we want to be and what kind of world we want to live in.

An example: Marilee Jones was a very successful Dean of Admissions at MIT for many years, but it turned out last year that she had faked her own resumé by inventing the degrees that she didn't have. And MIT had no choice but to fire her, because how can you judge other people's records and ask for their honesty when you yourself have lied about your past? There were only two reactions among students whom I was teaching: one reaction was that she was doing a good job so why was there a problem? The second reaction was "well, everybody lies on their resumé, right?"

Conclusion:

I want to close with two interesting quotations from Americans who have a deep sense of what is important. Reverend Martin Luther King Jr. said, "Intelligence plus character— that's the goal of true education". And philosopher Ralph Emerson said, "Character is more important than intellect". You are all in the business of educating young people and there are enormous pressures to make them excellent and especially IB schools which are good at achieving that end. I have nothing against excellence, but at the end of the day we

do not need more of the best and the brightest, but we need more of those who have good

character. That is why the issues of respect and ethics, which are hard to measure

objectively, are so terribly important. In conclusion, these are the main elements of my

Five Minds.

 For more information you can go to www.thegoodworkproject.org