



Training manual for course
“Innovative tools for Inclusion”



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Introduction

This document is part of the initiative IN PATH - Intelligent Pathways for Better Inclusion aims to break the pattern of transferring poverty and exclusion from one generation to the next, by empowering marginalised and disadvantaged citizens to easily manage everyday problems in different areas, and not to be held back because of their background. This objective will be achieved with the support of the Multiple Intelligence Theory (MI Theory) which was researched and developed by Howard Gardner of Harvard University. His mission was to challenge the traditional views held about intelligence and this resulted in the creation of different and unique intelligence profiles for learners. This proved that education can be improved by assessing learners' intelligence profiles and designing the training activities accordingly.

The following document is the training manual of the INPATH training course “*Innovative Tools for Inclusion*”, which was implemented for the first time by the English INPATH partner Pilgrims, and took place in Canterbury, United Kingdom from the 2nd to the 6th of September 2013. The course was implemented in the format “*Grundtvig In-Service Training Course*”, which focused on adult education and training. Interested adult trainers had the opportunity to apply for funding to participate in the training course from their National Agencies in the spring of 2013. The objective of the training manual is to detail the training course with the main day to day activities, background information relevant to the theory of multiple intelligence, and practical information for carrying out the training course.

The training manual is aimed for adult trainers, social work professionals, and training entities who deal with marginalized and disadvantaged adults with low competences, and who are interested in using the handbook in a training content.

Information for the training course

The main instrument for the training course is the Handbook - “Easy Answers for Hard Problems” developed within the INPATH project. The handbook is available from September 2013 for download from the project’s website <http://www.spi.pt/inpath> in English, Portuguese, Spanish, German, Italian, and Romanian.

The Handbook “New Pathways - Easy Answers for Hard Problems” is a resource for social work professionals and adult educators engaged in providing support to disadvantaged citizens and people at risk for social exclusion, providing them with innovative learning environments in order to facilitate their learning process and to increase their competences in the following areas:



Within this framework, the Handbook will provide the social worker/adult educator user with examples of how to recognize and work with the different intelligences identified by ¹Prof. Howard Gardner, when applying the theory with the specific aim of fostering the development of the above core skills.

The handbook contains knowledge about the theory of multiple intelligence, selected good practices, and exercises in all the intelligences in the four areas.

¹ Prof. Gardner in his book (1983) “Frames of Mind” is considering the founding father of the Multiple Intelligence theory. For more information, please visit <http://howardgardner.com/>

Practical items

In order to implement the course, it is necessary to have a room available for the participants, a white board, a music player, paper, pencils etc.

Each exercise in the handbook also has a set of resources required, and when preparing for the course it is recommended to consult each exercise.

Profile of the trainer

The trainer should possess the following competences:

- Experience in training delivery: especially non-formal training and informal learning contexts.
- Experience with adult learners.
- Wide knowledge in coaching, including MI Theory.
- Experience in group dynamics.

Course programme

Both the handbook and training course are very flexible learning tools, which can be adapted to different learning situations and different participant profiles, which means that the handbook can also be used as a complementary training instrument in an already planned training course, or the handbook can be used as the main training tool.

Example of programme of the training activities day by day:

Please note this is an example of a daily programme. Course content may often be usefully adapted to incorporate the needs of each specific group.

Example of a week course in MI theory:

	Monday	Tuesday	Wednesday	Thursday	Friday
9.00-10.30	Bonding and needs analysis	Observation Skills for creating an intelligence profile using a video clip from project zero. Subject: immigration/Human Rights	MI as an Entry Point to learning: Bridging from stronger into intelligences into weaker ones	Presentation of Intelligence profiles of group participants	Story: His First Flight Creation of a mandala to use in presentation of how participants will/can use M.I. in their work
11.00-13.30	Introduction to the Theory of Multiple Intelligence: "The Land of Smart"	Building a course around the nine intelligences: How to use MI in practice with the handbook	Re-design of activities Looking at how to apply this principle to existing activities	Application in each of the four areas in the programme, Intelligence Pathways to Better Inclusion Practical Work Source: The Handbook	Activities using M.I Performances of Understanding.
14.00-16.30	Criteria for an intelligence how to recognize and build up an intelligence profile:	MI and understanding: MI activities compared to traditional activities/ Introducing critical thinking skills*	Using Rich Task Thinking as a means of analysing an activity through the nine intelligences	Group Work with the creation of a wiki of a four hour course content, which will be accessible to all the participants	Review of the week, including the participant's and the trainer's feedback

*comparing and contrasting, relating facts, analysing, assessing, inferring, presenting evidence, generalizing, diagnosing, synthesizing, evaluating, creating models, explaining, theorizing, predicting, categorizing, defining distinction, judging, making connections, deciding, classifying/chunking, and making analogy.

Howard Gardner's work around multiple intelligences has had a profound impact on thinking and practice in education - especially in the United States. Here we explore the theory of multiple intelligences; why it has found a ready audience amongst educationalists; and some of the issues around its conceptualization and realization.



Howard Gardner, multiple intelligences and education

I want my children to understand the world, but not just because the world is fascinating and the human mind is curious. I want them to understand it so that they will be positioned to make it a better place. Knowledge is not the same as morality, but we need to understand if we are to avoid past mistakes and move in productive directions. An important part of that understanding is knowing who we are and what we can do... Ultimately, we must synthesize our understandings for ourselves. The performance of understanding that try matters are the ones we carry out as human beings in an imperfect world which we can affect for good or for ill.

(Howard Gardner 1999: 180-181)

Howard Earl Gardner's (1943-) work has been marked by a desire not to just describe the world but to help to create the conditions to change it. The scale of Howard Gardner's contribution can be gauged from following comments in his introduction to the tenth anniversary edition of his classic work *Frames of Mind. The Theory of Multiple Intelligences*:

In the heyday of the psychometric and behaviorist psychology, it was generally believed that intelligence was a single entity that was inherited; and that human beings - initially a blank slate – could be trained to learn anything, provided that it was presented in an appropriate way. Nowadays an increasing number of researchers believe precisely the opposite; that there exists a multitude of intelligences, quite independent of each other; that each intelligence has its own strengths and constraints; that the mind is far from unencumbered at birth; and that it is unexpectedly difficult to teach things that go against early 'naive' theories of that challenge the natural lines of force within an intelligence and its matching domains. (Gardner 1993: xxiii) One of the main impetuses for this movement has been Howard Gardner's work. He has been, in Smith and Smith's (1994) terms, a paradigm shifter. Howard Gardner has questioned the idea that intelligence is a single entity, that it results from a single factor, and that it can be measured simply via IQ tests. He has also challenged the cognitive development work of Piaget.

Bringing forward evidence to show that at any one time a person may be at very different stages of development. For example, in number development and spatial/visual maturation, Howard Gardner has successfully undermined the idea that knowledge at any one particular developmental stage hangs together in a structured whole.

In this article we explore Howard Gardner's contribution and the use to which it has been put by educators.

Howard Gardner - a life

Howard Gardner was born in Scranton, Pennsylvania in 1943. His parents had fled from Nürnberg in Germany in 1938 with their three-year old son, Eric. Just prior to Howard Gardner's birth, Eric was killed in a sleighing accident. These two events were not discussed during Gardner's childhood, but were to have a very significant impact upon his thinking and development (Gardner 1989: 22). The opportunities for risky physical activity were limited, and creative and intellectual pursuits encouraged. As Howard began to discover the family's 'secret history' (and Jewish identity) he started to recognize that he was different both from his parents and from his peers.

His parents wanted to send Howard to Phillips Academy in Andover Massachusetts – but he refused. Instead he went to a nearby preparatory school in Kingston, Pennsylvania (Wyoming Seminary). Howard Gardner appears to have embraced the opportunities there – and to have elicited the support and interest of some very able teachers. From there he went to Harvard University to study history in readiness for a career in the law. However, he was lucky enough to have Eric Erikson as a tutor. In Howard Gardner's words Erikson probably 'sealed' his ambition to be a scholar (1989: 23). But there were others:

"My mind was really opened when I went to Harvard College and had the opportunity to study under individuals - such as psychoanalyst Erik Erikson, sociologist David Riesman, and cognitive psychologist Jerome Bruner - who were creating knowledge about human beings. That helped set me on the course of investigating human nature, particularly how human beings think."
(Howard Gardner quoted by Marge Sherer 1999).

Howard Gardner's interest in psychology and the social sciences grew (his senior thesis was on a new California retirement community) and he graduated summa cum laude in 1965.

Howard Gardner then went to work for a brief period with Jerome Bruner on the famous MACOS Project ('Man: A Course of Study'). Bruner's work, especially in *The Process of Education* (1960) was to make a profound impact, and the questions that the programme asked were to find an echo in Gardner's subsequent interests.

During this time he began to read the work of Claude Levi-Strauss and Jean Piaget in more detail. He entered Harvard's doctoral programme in 1966, and in the following year became part of the Project Zero research team on arts education (with which he has remained involved to the present). Howard Gardner completed his PhD in 1971 (his dissertation was on style sensitivity in children). He remained at Harvard. Alongside his work with Project Zero (he now co-directs it with David Perkins) he was a lecturer (1971-1986) and then professor in education (1986-). His first major book, *The Shattered Mind* appeared in 1975 and some fifteen have

followed. Howard Gardner is currently Hobbs Professor of Cognition and Education at the Harvard Graduate School of Education and adjunct professor of neurology at the Boston University School of Medicine.

Project Zero provided an environment in which Howard Gardner could begin to explore his interest in human cognition. He proceeded in a very different direction to the dominant discourses associated with Piaget and with psychometric testing. Project Zero developed as a major research centre for education – and provided an intellectual home for a significant grouping of researchers. A key moment came with the establishment of the Project on Human Potential in the late 1970s (funded by Bernard van Leer Foundation) to ‘assess the state of scientific knowledge concerning human potential and its realization’. The result was *Frames of Mind* (1983) Howard Gardner’s first full-length statement of his theory of multiple intelligences.

Howard Gardner on multiple intelligences - the initial listing

Howard Gardner viewed intelligence as ‘the capacity to solve problems or to fashion products that are valued in one or more cultural setting’ (Gardner & Hatch, 1989). He reviewed the literature using eight criteria or ‘signs’ of an intelligence:

- Potential isolation by brain damage. The existence of idiots savants, prodigies and other exceptional individuals.
- An identifiable core operation or set of operations.
- A distinctive development history, along with a definable set of ‘end-state’ performances.
- An evolutionary history and evolutionary plausibility.
- Support from experimental psychological tasks.
- Support from psychometric findings.
- Susceptibility to encoding in a symbol system.

(Howard Gardner 1983: 62-69)

Candidates for the title ‘an intelligence’ had to satisfy a range of these criteria and had to include, as a prerequisite, the ability to resolve ‘genuine problems or difficulties’ (*ibid*: 60) within certain cultural settings. Making judgements about this was, however, ‘reminiscent more of an artistic judgement than of a scientific assessment’ (*ibid*: 62).

Howard Gardner initially formulated a list of seven intelligences. His listing was provisional. The first two have been typically valued in schools; the next three are usually associated with the arts; and the final two are what Howard Gardner called ‘personal intelligences’ (Gardner 1999: 41-43).

Linguistic intelligence involves sensitivity to spoken and written language, the ability to learn languages, and the capacity to use language to accomplish certain goals. This intelligence includes the ability to effectively use language to express oneself rhetorically or poetically; and language as a means to remember information. Writers, poets, lawyers and speakers are among those that Howard Gardner sees as having high linguistic intelligence.

Logical-mathematical intelligence consists of the capacity to analyze problems logically, carry out mathematical operations, and investigate issues scientifically. In Howard Gardner's words, it entails the ability to detect patterns, reason deductively and think logically. This intelligence is most often associated with scientific and mathematical thinking.

Musical intelligence involves skill in the performance, composition, and appreciation of musical patterns. It encompasses the capacity to recognize and compose musical pitches, tones, and rhythms. According to Howard Gardner musical intelligence runs in an almost structural parallel to linguistic intelligence.

Bodily-kinesthetic intelligence entails the potential of using one's whole body or parts of the body to solve problems. It is the ability to use mental abilities to coordinate bodily movements. Howard Gardner sees mental and physical activity as related. This ability is often noticed in sports performances, dancing, and actors.

Spatial intelligence involves the potential to recognize and use the patterns of wide space and more confined areas. This can be noted in designers, architects, artists and explorers.

Interpersonal intelligence is concerned with the capacity to understand the intentions, motivations and desires of other people. It allows people to work effectively with others. Educators, salespeople, religious and political leaders and counsellors all need a well-developed interpersonal intelligence.

Intrapersonal intelligence entails the capacity to understand oneself, to appreciate one's feelings, fears and motivations. In Howard Gardner's view it involves having an effective working model of ourselves, and to be able to use such information to regulate our lives.

In *Frames of Mind* Howard Gardner treated the personal intelligences 'as a piece'. Because of their close association in most cultures, they are often linked together. However, he still argues that it makes sense to think of two forms of personal intelligence. Gardner claimed that the seven intelligences rarely operate independently. They are used at the same time and tend to complement each other as people develop skills or solve problems.

In essence Howard Gardner argued that he was making two essential claims about multiple intelligences. That:

The theory is an account of human cognition in its fullness. The intelligences provided 'a new definition of human nature, cognitively speaking' (Gardner 1999: 44). Human beings are organisms who possess a basic set of intelligences.

People have a unique blend of intelligences. Howard Gardner argues that the big challenge facing the deployment of human resources 'is how to best take advantage of the uniqueness conferred on us as a species exhibiting several intelligences' (*ibid.*: 45).

These intelligences, according to Howard Gardner, are amoral – they can be put to constructive or destructive use.

The appeal of multiple intelligences to educators

Howard Gardner's theory of multiple intelligences has not been readily accepted within academic psychology. However, it has met with a strongly positive response from many educators. It has been embraced by a range of educational theorists and, significantly, applied by teachers and policymakers to the problems of schooling. A number of schools in North America have looked to structure their curricula according to the intelligences, and to design classrooms and even whole schools to reflect the understandings that Howard Gardner develops. The theory can also be found in use within pre-school, higher, vocational and adult education initiatives.

This appeal was not, at first, obvious.

At first sight - this diagnosis would appear to sound a death knell for formal education. It is hard enough to teach through one intelligence; what if there are seven? It is hard to enough to teach even when something can be taught; what to do if there are distinct limits and strong constraints on human cognition and learning? (Howard Gardner 1993: xxiii)

Howard Gardner responds to his questions by first making the point that psychology does not directly dictate education, 'it merely helps one to understand the conditions within which education takes place'.

What is more:

Seven kinds of intelligence would allow seven ways to teach, rather than one. And powerful constraints that exist in the mind can be mobilized to introduce a particular concept (or whole system of thinking) in a way that children are most likely to learn it and least likely to distort it. Paradoxically, constraints can be suggestive and ultimately freeing. (*op. cit.*)

Mindy L. Kornhaber (2001: 276), a researcher involved with Project Zero, has identified a number of reasons why teachers and policymakers in North America have responded positively to Howard Gardner's presentation of multiple intelligences. Among these are ... *the theory validates educators' everyday experience: students think and learn in many different ways. It also provides educators with a conceptual framework for organizing and reflecting on curriculum assessment and pedagogical practices. In turn, this reflection has led many educators to develop new approaches that might better meet the needs of the range of learners in their classrooms.*

The response to Howard Gardner is paralleled by the adoption of Kolb's model of experiential learning by adult and informal educators. While significant criticism can be made of the formulation (see below) it does provide a useful set of questions and 'rules of thumb' to help educators to think about their practice. The way in which Howard Gardner's theory of multiple intelligences has been translated into policy and practice has been very varied. Howard Gardner did not, initially, spell out the implications of his theory for educators in any detail. Subsequently, he has looked more closely at what the theory might mean for schooling practice (e.g. in *The Unschooled Mind*, *Intelligence Reframed*, and *The Disciplined Mind*). From these works three particular aspects of Gardner's thinking needs noting here as they allow for

hope, and an alternative way of thinking, for those educators who feel out of step with the current, dominant product orientation to curriculum and educational policy. The approach entails:

A broad vision of education - All seven intelligences are needed to live life well. Teachers, therefore, need to attend to all intelligences, not just the first two that have been their tradition concern. As Kornhaber (2001: 276) has noted it involves educators opting ‘for depth over breadth’. Understanding entails taking knowledge gained in one setting and using it in another. ‘Students must have extended opportunities to work on a topic’ (*op. cit.*).

Developing local and flexible programmes - Howard Gardner’s interest in ‘deep understanding’, performance, exploration and creativity are not easily accommodated within an orientation to the ‘delivery’ of a detailed curriculum planned outside of the immediate educational context. ‘An “MI setting” can be undone if the curriculum is too rigid or if there is but a

+single form of assessment’ (Gardner 1999: 147). In this respect the educational implications of Howard Gardner’s work stands in a direct line from the work of John Dewey.

Looking to morality - ‘We must figure out how intelligence and morality can work together’, Howard Gardner argues, ‘to create a world in which a great variety of people will want to live’ (Gardner 1999: 4). While there are considerable benefits to developing understanding in relation to the disciplines, something more is needed.

Are there additional intelligences?

Since Howard Gardner’s original listing of the intelligences in *Frames of Mind* (1983) there has been a great deal of discussion as to other possible candidates for inclusion (or candidates for exclusion). Subsequent research and reflection by Howard Gardner and his colleagues has looked to three particular possibilities: a naturalist intelligence, a spiritual intelligence and an existential intelligence (Gardner 1999: 52).

Naturalist intelligence enables human beings to recognize, categorize and draw upon certain features of the environment. It ‘combines a description of the core ability with a characterization of the role that many cultures value’ (*ibid*: 48).

Existential intelligence, a concern with ‘ultimate issues’, is, thus, the ninth intelligence that Howard Gardner considered – and he argues that it ‘scored reasonably well on the criteria’ (*ibid*.: 64).

the position with regard to **spiritual intelligence** is far more complex. According to Howard Gardner (1999: 59) there are problems, for example, around the ‘content’ of spiritual intelligence, its privileged but unsubstantiated claims with regard to truth value, ‘and the need for it to be partially identified through its effect on other people’. As a result:

It seems more responsible to carve out that area of spirituality closest ‘in spirit’ to the other intelligences and then, in the sympathetic manner applied to naturalist intelligence, ascertain how this candidate intelligence fares. In doing so, I think it best to put aside the term *spiritual*,

with its manifest and problematic connotations, and to speak instead of an intelligence that explores the nature of existence in its multifarious guises. Thus, an explicit concern with spiritual or religious matters would be one variety – often the most important variety – of an existential intelligence.

The final, and obvious, candidate for inclusion in Howard Gardner's list is **moral intelligence**. In his exploration, he begins by asking whether it is possible to delineate the 'moral domain'. He suggests that it is difficult to come to any consensual definition, but argues that it is possible to come to an understanding that takes exploration forward. Central to a moral domain, Howard Gardner suggests, 'is a concern with those rules, behaviours and attitudes that govern the sanctity of life – in particular, the sanctity of human life and, in many cases, the sanctity of any other living creatures and the world they inhabit' (*ibid.*: 70). If we accept the existence of a moral realm is it then possible to speak of moral intelligence? If it 'connotes the adoption of any specific moral code' then Howard Gardner does not find the term moral intelligence acceptable (*ibid.*: 75). Furthermore, he argues, researchers and writers have not as yet 'captured the essence of the moral domain as an instance of human intelligence' (*ibid.*: 76).

As I construe it, the central component in the moral realm or domain is a sense of personal agency and personal stake, a realization that one has an irreducible role with respect to other people and that one's behaviour towards others must reflect the results of contextualized analysis and the exercise of one's will.... The fulfilment of key roles certainly requires a range of human intelligences – including personal, linguistic, logical and existential – but it is fundamentally a statement about the kind of person that has developed to be. It is not, in itself, an intelligence. 'Morality' is then properly a statement about personality, individuality, will, character - and, in the happiest cases, about the highest realization of human nature. (*ibid.*: 77)

So it is that Howard Gardner has added an eighth and ninth intelligence - naturalist and existential intelligence - to his list.

Howard Gardner's multiple intelligences - some issues and problems

There are various criticisms of, and problems around, Howard Gardner's conceptualization of multiple intelligences. Indeed, Gardner himself has listed some of the main issues and his responses (1993: xxiii-xxvii; 1999: 79-114). Here, I want to focus on three key questions that have been raised in debates. (There are plenty of other questions around – but these would seem to be the most persistent):

Are the criteria Howard Gardner employs adequate? John White (1997) has argued that there are significant issues around the criteria that Howard Gardner employs. There are questions around the individual criteria, for example, do all intelligences involve symbol systems; how the criteria to be applied; and why these particular criteria are relevant. In respect of the last, and fundamental question, White states that he has not been able to find any answer in Gardner's writings (*ibid.*: 19). Indeed, Howard Gardner himself has admitted that there is an element of subjective judgement involved.

Does Howard Gardner's conceptualization of intelligence hold together? For those researchers and scholars who have traditionally viewed intelligence as, effectively, what is

measured by intelligence tests – Howard Gardner’s work will always be problematic. They can still point to a substantial tradition of research that demonstrates correlation between different abilities and argue for the existence of a general intelligence factor. Howard Gardner (1993: xxiv) disputes much of the evidence and argues that it is not possible, as yet, to know how far intelligences actually correlate. More recent developments in thinking around intelligence such as Robert Sternberg’s (1985, 1996) advancement of a ‘triarchic model’ have shared Gardner’s dislike of such standard intelligence theory. However, in contrast to Howard Gardner, Robert Sternberg does not look strongly at the particular material that the person is processing. Instead he looks to what he calls the componential, experiential and contextual facets of intelligence. A further set of criticisms centre around the specific intelligences that Howard Gardner identified. For example, it can be argued that musical intelligence and bodily-kinesthetic intelligence are better approached as talents (they do not normally need to adapt to life demands).

Is there sufficient empirical evidence to support Howard Gardner’s conceptualization? A common criticism made of Howard Gardner’s work is that his theories derive rather more strongly from his own intuitions and reasoning than from a comprehensive and full grounding in empirical research. For the moment there is not a properly worked-through set of tests to identify and measure the different intelligences.

“I once thought it possible to create a set of tests for each intelligence – an intelligence-fair version to be sure – and then simply to determine the correlation between the scores on the several tests. I now believe that this can only be accomplished if someone developed several measures for each intelligence and then made sure that people were comfortable in dealing with the materials and methods used to measure each intelligence.” (Gardner 1999: 98)

Howard Gardner himself has not pursued this approach because of a more general worry with such testing – that it leads to labelling and stigmatization. It can be argued that research around the functioning of the brain generally continues to support the notion of multiple intelligence (although not necessarily the specifics of Howard Gardner’s theory).

There are further questions around the notion of selfhood that Howard Gardner employs – something that he himself has come to recognize. In the early 1990s he began to look to the notion of distributed cognition as providing a better way of approaching the area than focusing on what goes on in the mind of a single individual (Hatch and Gardner 1993).

Conclusion

While there may be some significant questions and issues around Howard Gardner’s notion of multiple intelligences, it still has had utility in education. It has helped a significant number of educators to question their work and to encourage them to look beyond the narrow confines of the dominant discourses of skilling, curriculum, and testing. For example, Mindy Kornhaber and her colleagues at the Project SUMIT (Schools Using Multiple Intelligences Theory) have examined the performance of a number of schools and concluded that there have been significant gains in respect of SATs scores, parental participation, and discipline (with the schools themselves attributing this to MI theory). To the extent that Howard Gardner’s multiple intelligences theory has helped educators to reflect on their practice, and given them

a basis to broaden their focus and to attend to what might assist people to live their lives well, then it has to be judged a useful addition.

Project SUMIT (2000) uses the metaphor of *Compass Points* -routes that educators using the theory have taken and which appear to benefit students'. They have identified the following markers that characterize schools with some success in implementing practices that attend to multiple intelligences theory.

Culture: support for diverse learners and hard work. Acting on a value system which maintains that diverse students can learn and succeed, that learning is exciting, and that hard work by teachers is necessary.

Readiness: awareness-building for implementing MI. Building staff awareness of MI and of the different ways that students learn.

Tool: MI is a means to foster high quality work. Using MI as a tool to promote high quality student work rather than using the theory as an end in and of itself.

Collaboration: informal and formal exchanges. Sharing ideas and constructive suggestions by the staff in formal and informal exchanges.

Choice: meaningful curriculum and assessment options. Embedding curriculum and assessment in activities that are valued both by students and the wider culture.

Arts. Employing the arts to develop people's skills and understanding within and across disciplines.

Informal educators can usefully look at this listing in respect of their projects and agencies. The multiple intelligences themselves also provide a good focus for reflection. Arguably, informal educators have traditionally been concerned with the domains of the interpersonal and the intrapersonal, with a sprinkling of the intelligences that Howard Gardner identifies with the arts. Looking to naturalist, linguistic, and logical-mathematical intelligences could help enhance their practice.

Edited by Bonnie Tsai

Further reading and references

The main Howard Gardner writings on multiple intelligences are as follows:

Gardner, Howard (1983; 1993) *Frames of Mind: The theory of multiple intelligences*, New York: Basic Books. The second edition was published in Britain by Fontana Press. 466 + xxix pages. (All references in this article refer to this second, 10th Anniversary, edition). A major addition to the literature of cognitive psychology being the first full length explication of multiple intelligences.

Gardner, Howard (1989) *To Open Minds: Chinese clues to the dilemma of contemporary education*, New York: Basic Books. This book includes a significant amount of material on Gardner's early life.

Gardner, H. (1991) *The Unschooled Mind: How children think and how schools should teach*, New York: Basic Books.

Gardner, Howard (1999) *Intelligence Reframed. Multiple intelligences for the 21st century*, New York: Basic Books. 292 + x pages. Useful review of Gardner's theory and discussion of issues and additions.

Gardner, Howard (1999) *The Disciplined Mind: Beyond Facts And Standardized Tests, The K-12 Education That Every Child Deserves*, New York: Simon and Schuster (and New York: Penguin Putnam).

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A Conversation with Howard Gardner: A View after Twenty-Five Years

Bonnie Tsai and Howard Gardner

Everyone is always curious about the when you are going “to discover” another intelligence. I have been extremely conservative about adding intelligences to ones which have already met the eight features of the criteria. I think of an intelligence as a kind of mental chemistry set; it is more useful to explain many human capacities as possible through a combination of existing elements rather than through the creation of a new one. A philosophical capacity-including the existential dimension- could be explained through a combination of language and logical capabilities.

I have thought about two other candidates: humor intelligence and moral intelligence. For different reasons, I think that neither candidate qualifies. With humor, I believe it is simply a light-hearted revision of our logical capacity. In humor, the normal state of affairs is altered in some logical way. If we think something is funny, our own logical and intrapersonal intelligences are involved. If other people find us funny or humorous, it is because we have used logic to engage their interpersonal intelligence. It doesn’t matter if we think something is funny; what matters is that we understand our audience well enough to evoke a funny response.

Many individuals believe that human beings have a moral capacity that is present from birth and that morality follows a predictable trajectory through maturity. Intelligences, however, are presented in a descriptive way and not in a normative way. Intelligence is simply a computational capacity; individuals with a high intelligence with language are able to compute linguistic information more rapidly than people who have less linguistic capacity. How one uses their linguistic intelligence is a question of values and norms and so falls outside the descriptive realm.

Many people find there is confusion between intelligences and learning styles. Could you clarify this for us?

One of the most important clarifications in the MI theory resulted from my own confusion. When I first wrote about multiple intelligences, I was insensitive to the distinction between intelligence and a domain, which is a discipline or a craft. This confusion caused me to ignore certain points and contributed to some ill-considered approaches to using the theory. Intelligence is a computational capacity. For example, an individual with a high musical intelligence finds it easy to remember melodies, to recreate rhythms, to trace changes that take place in a theme over the course of a composition. On the other hand, a domain is an organized activity within society, in which one can readily array individuals in terms of expertise. A quick glimpse of the range of domains can be seen in a list of occupations or course offerings in university catalog.

The confusion arises because intelligences and domains may share the same name. There is a musical intelligence and the domain of music. A domain such as music or to be more specific a musical performance can involve any number of intelligences.

In short, an intelligence is a biopsychological construct; a domain is a sociological construct. No doubt there are interesting connections between kinds of intelligences we possess and the kinds of domains we develop, and how these intelligences and domains map onto each other. It is lamentable when educators are unaware of this distinction. It leads to situations where teachers say, “Johnny can’t learn geometry because he doesn’t have a spatial intelligence.” Certainly spatial intelligence is helpful for learning geometry; and the challenge facing each geometry teacher is to figure out how to teach student geometry even if their spatial intelligence is not their strongest.

Howard Gardner is the John H. and Elizabeth A. Hobbs Professor in Cognition and Education at the Harvard Graduate School of Education. Among numerous honors, Gardner received a MacArthur Prize Fellowship in 1981. In 1990, he was the first American to receive the University of Louisville’s Grawmeyer Award in education.

In 2000 he was awarded a Guggenheim Fellowship. He is the author of Frames of Mind, The Unschooled Mind, and Intelligence Reframed, among other books. He lives in Cambridge, Massachusetts.

For more about Project Zero and Multiple Intelligence go to: info@pz.harvard.edu

The Reggio Project

Contribution by Alison Higgins

The pre-schools of Reggio Emilia in Northern Italy have been visited by scores of early years educators from all over the world because of their unique approach to exploring children’s innate ability to express themselves in different ways. The schools were founded by Loris Malaguzzi in the aftermath of the Second World War, with strong support from parents and the local community. Malaguzzi stressed the importance of children perceiving themselves as authors and inventors. As he explained, “... once they are helped to discover the pleasures of inquiry, their motivation and interest explode.”

A few years ago I was given the opportunity to take part in a project that aimed to recreate some of the aspects of the Reggio philosophy with a class of 4-5 year olds in Kent, England. The project involved colleagues from other local schools and we met together on a regular basis to discuss, reflect and evaluate what we had achieved. Some of the key points of the Reggio approach that I hoped to incorporate into my project included; involving parents and the local community, using the physical environment, allowing the children to steer the project forward, documenting the children’s experiences and work, allowing the children to express themselves through a variety of different media, recording what the children say and giving the children a chance to reflect on what they have seen/done/created etc.

Starting the project

One of the key features that Malaguzzi emphasised was the impact of the local environment on the young child. Projects that hoped to borrow from the Reggio philosophy therefore needed to look around locally to ensure that it was relevant to the children. In my case we had a beach within walking distance of the school so the sea was an obvious starting point. It was decided that the project would involve exploring the beach but the reason for going and how they would explore it would be dictated by the children. The twenty-eight children in the class had been at the school for a month and loved listening to stories so the project began with a story connected to the sea. The children, however, were unaware that they were influencing the plot.

Setting the scene

A display table was set up with a few beach related objects – a tiny treasure chest, a few shells, some old rope and a pirate’s eye patch and in one corner, a clear bottle. The children were not told anything about the contents but they were all curious about the table and were especially keen to explore the shells. The next day I rolled up a letter and placed it in the bottle. Again, I waited for the children to notice which they did before the register had even been called. The letter was from a man called Ben who wrote about his Uncle Cornelius, a sailor who ended up shipwrecked on an island. At the end of the letter Ben asked the children what they thought would happen next. Their answers were recorded and provided the starting point for the next letter.

The story continued through Ben’s letters with the children’s ideas woven in. The children decided Uncle Cornelius was a pirate who was looking for treasure which gave us the reason for exploring the beach.

Using the local environment

The next phase of the project involved a visit to the beach. Armed with buckets and spades, the children walked down to the beach to look for treasure and found plenty of ‘special stones’, bits of seaweed and shells. Two finds connected to the Uncle Cornelius story included a pirate’s button (an old metal button) and a piece of the shipwreck (wood). The trip was recorded through photographs and video. When the children got back they pored over the finds and were keen to display their ‘treasure’. One child noted that the treasure chest in the display was too small for all the treasure we had found which led to the whole class designing and making treasure boxes out of shoe boxes. The children were interviewed about their designs and how they hoped to achieve a 3D version. Some of the children found the ‘How?’ ‘Why?’ and ‘What if ...?’ questions difficult to answer at this stage but as the project progressed they became more confident in articulating their thoughts. The vast majority did not waver from their initial design to the end product. Skills and techniques were taught such as how to attach shells and stones to the outside of the box but the children were left to organise themselves. It was interesting to notice how involved the children all were and how few of them asked for adult help. The results were of a very high standard and once again the children were recorded at work by video and photos and through written observations.

A surprising turn

Before long the project was generating its own momentum due to the way it aroused the children's curiosity. As Christmas was approaching the display table was cleared to make room for a nativity scene. The children were aghast and asked how Ben's letters would reach us now the bottle had gone. I had thought that we had finished with Ben and his letters now we had been to the beach and was unsure how we could continue so I encouraged the children to write to him. During their own choosing time, several children wrote messages to Ben. Some were simple greetings but several children asked Ben to send them some treasure.

More letters

Letters arrived from Ben whom the children assumed was a pirate. He promised to send treasure from Australia. The treasure was a mixture of local beach finds. Through Ben's letters the children found out the name of the shell/seaweed and what was special about it, for example, sea kelp was used by Uncle Cornelius to forecast the weather. These local beach finds were displayed and it became a busy area as children explored the shells and seaweed with various senses. A few weeks later they surprised me by remembering the names of all the different shells and seaweed. The children continued to write messages to Ben, roll them up and place them in the bottle. Some children were writing random letter shapes, but other children were beginning to write simple sentences. Ben's letters back were always in reply to the children's letters. At one point, when they had not received a letter from Ben for a while, the children decided he must be ill and several children posted 'get well soon' messages in the bottle. Having a real audience for their writing had a huge impact on the children, especially the boys. The writing area was in constant use during child-initiated activity time. Never before or since have I had so many children writing so frequently through their own choice.

An interesting parcel from Africa

Given the children's enjoyment in designing and making their treasure boxes, I thought the children would like to design a treasure chest out of wood. A local timber yard donated some wood and a retired carpenter agreed to make up the chest to the children's design. One morning the children arrived to find three large pieces of wood were next to the display. Ben's letter informed the children the wood was from him. A special wood that was renowned for its strength that could only be found in Africa. Ben asked the children in his letter what they could make with it. Hands shot up and the class came up with several suggestions from making a wooden cross (it was the week before Easter) to a boat. By this time it was clear how confident the children were at answering Ben's questions. Their answers could never be wrong and the children were respectful of each other's responses. The children themselves suggested we should decide by voting for the most popular suggestions. As an example of the way in which the children were now directing the learning, nearly all the children wanted to make a boat with the wood rather than the treasure box I had envisaged. The children designed their boat on paper and were questioned to extend their thinking. For example the children were asked how many sides their boat had and how could the three pieces of wood be used to provide that number of sides. A boy in the class thought we should find some pictures of boats and suggested looking in the library. Children played a central role in all aspects of the boat's design.

The boat is built

The children's design was followed and the carpenter created a wooden boat large enough for four small pirates. It was a huge hit with the children and much more fun to play in than a treasure box would have been!

More treasure

The children continued with their letter writing with the main request being that they would like Ben to send more treasure. I set up another visit to the beach and this time we dressed up as pirates. As we headed down the cliff some children spotted a large 'Jolly Roger' flag in the middle of the sand. Not far away were two pirates. The children's excitement was infectious. They were sure it was Pirate Ben. As we gathered around the flag we discovered it was Pirate Ben and his first Mate, Pirate Brendan. The children listened intently as Pirate Ben explained that he was sure treasure was buried on the beach under the X marks in the sand. The children dug up several copper coins. Pirate Ben later showed the children how to make their old coins all shiny by putting them into his magic mixture (vinegar). The writing continued after this memorable day as children wrote to say how much they had enjoyed meeting him and helping him find the treasure.

Involving parents & members of the local community

An integral part of the project was involving parents and members of the local community. In the early stages, a meeting was held with parents to explain the idea behind the project and to request donations of disposable cameras so that we could record the children. The parents were kept informed of what their children were doing in this project through regular newsletters. They also continued to donate items such as empty shoe boxes for the treasure chests. At the end of the academic year, the parents were invited to an exhibition of the children's work and to see the documentary evidence; videos, photos and quotes.

My colleagues provided invaluable support in practical ideas and contacts. Pirate Ben was played by a retired coastguard with an interest in amateur dramatics. The carpenter was the father of a colleague and without all this support and the encouragement from the head teacher to follow the children's direction, the project would not have been the success it was.

Reflecting on this project

As a teacher of young children used to following a curriculum it proved to an exciting year full of unexpected twists. I could never have predicted the effect of Ben's letters on the children's writing nor the outcome of the wood. By taking ownership of the learning these children were engaged and involved at all stages. Parents also commented on the inspirational impact it had on their children. Another strength of the project was the way in which it provided natural opportunities for cross-curricular activities. Whilst reflecting on what the children had achieved by the end, it was clear that we had touched on all areas of the curriculum.

The experience for me as a teacher was invaluable. I began the project hoping to follow some of the principles of the Reggio approach but had not anticipated how motivating it would be to be collaborating with the children rather than directing what they would do. Looking at the

work of the teachers at the schools in Reggio Emilia I recognise how skilled they are in questioning the children to make them reflect and explore ideas and this is the skill which I hope to improve for my next project.

Alison Higgins is a primary school teacher in Kent, England. She also teaches part time for Pilgrims in Canterbury. A graduate from Warwick University, she spent several years teaching English abroad firstly in Lisbon, Portugal then Pistoia, Italy. In Pistoia, she set up a language school with her husband and it was here that she first began to feel inspired by the way the local nursery school was educating her young son.

Multiple Intelligence and the Workplace

“Skill is a cultural medium. It shows how well people perform within a domain of knowledge valued in a culture.”

-Howard Gardner-

- How do people develop work-related intelligences?
- What determines work-related intelligence?
- How have changes in the nature of work affected intellectual demands?
- How can work organizations foster or impede intelligence?

Recent Changes in the Workplace

Today, in the workplace no one person has the complete set of skills needed to do the work. In organizations today using the “new technology”, such as computerized machines, knowledge tends to be fragmented. No one from the Chief Executive Officer on down has the complete set of skills needed to do the job. This is because large organizations cannot for practical and financial reasons train their employees in the whole range and level of skills needed for everything to run smoothly. Intelligence, which was once thought of as being individual, has become organizational. It is used in solving real world problems in which many people hold pieces of the solution, but not the whole. In real world problem-solving, people have to be able to weigh risks and uncertainties. For this reason there is a need for and a potential for sharing information related to in-group work. To do this, workers have to be able to respond quickly and flexibly. They must build up the level of confidence to ask other colleagues to help them when something unpredictable happens. In this case it is vital that people are able to work together to solve the problem. This was dramatically illustrated a few years ago by a plane crash in Portland, Oregon. The co-pilot saw what was going to happen and had the expertise to set it right. But he had a bad working relationship with the pilot and was too afraid of his reaction to say anything. So the plane crashed and lives were lost. According to Daniel Goleman, author of *Emotional Intelligence*, workers in the future will need to build up a sense of trust and confidence so that they can share and exchange information with colleagues. This seems to happen when some kind of social contact outside the workplace has established empathy between colleagues.

Reasons for the Change

So what has happened to bring about these changes in the workplace? There has been a real shift from workers needing physical skills to intellectual ones. Let me give you an example, I was asked some years ago to set up a self-access center in a papermaking company in the southwest of France. While there, I was shown around the production area where the paper was being made. This was not a pleasant place to be in because of the horrible smell that goes along with the papermaking process. The workers at this time were directly involved in the production of paper. They were physically handling the machines, vats and rollers. Each worker was assigned a specific job, which he did over and over again, day in and day out. There was a foreman who oversaw the operation and social conversation was frowned upon because obviously this cut down on production time. If any problem arose, it was solved by physical clues such as the feel or smell of the paper pulp. Workers could test the pulp with their hands to see if everything was normal. If a problem came up, it was solved by direct contact with the machine.

Recently I returned to this same company and what a change! These same workers were still doing the same job, but under very different conditions. Now instead of a dark, damp workspace, they were working behind glass panels in a well-lit, air-conditioned room. Instead of industrial machines they were making paper using computers. Physical contact with papermaking had been replaced by a more intellectual symbolic way of doing their job. To check on how things were going, they had to look at a computer and use its data to make decisions. If something went wrong they couldn't just go and fix the machine. Now they had to stay by the computer and think about the sequence and how they could change it to solve the problem. They needed to manipulate symbolic media instead of relying on rote. Drawing on Gardner's concept of what intelligence is they had moved from a bodily-kinesthetic intelligence to a more mathematical-logical one. Today's workers need to know how to think. As S. Zuboff who did extensive research in this area states in her book, *The Age Of Smart Machines*, "Your past physical mobility must be translated into mental thought processes."

Backward versus Forward Thinking

To understand better how thinking has changed in the workplace, we need to compare backward to forward thinking. A hundred years ago scientists around the world were satisfied that they had arrived at an accurate picture of the physical world. Indeed many scientists felt that the study of physics was nearly completed: no big discoveries remained to be made, only details and finishing touches.

Then some interesting things began to happen. Röntgen discovered rays that could pass through human skin. Because he wasn't sure what they were, he called them X rays. A few months later, Henri Becquerel found a natural ore emitting something that fogged photographic plates. This was called radioactivity. Thus we were on the road to the discovery of an invisible world.

Physicists remained calm, expecting that these oddities could be easily explained by existing theory. This is the attitude of the backward thinker. Nevertheless another kind of thinker moved away from the existing theory, created an entirely new conception of the universe, and

of new technologies that would transform daily life in unimaginable ways. These people were the forward thinkers.

The forward thinker works from existing information to go on and find new facts and solve problems in a different way. In the process existing theory might change, evolve, or be proved wrong. In comparison the backward thinker finds information to back up and prove yet once again existing theory. In other words they seek solutions that conform to present beliefs. Forward thinkers on the other hand challenge what has been proven and even break rules in order to find new and innovative ways of doing things.

Practical Interlude

Here is an activity you can use with your students in order for them to experience backward and forward thinking. I call it *The Great Pipe Cleaner Challenge*. Give 10 pipe cleaners to each student. Ask them to make a hat using only 5 of them. That's all. Don't elaborate. Give ten minutes to complete the task. When the time is up, review the results.

It's not unusual to find the majority of students did exactly what you told them to do. They will have made some kind of hat following your instructions. These people followed the "rule" you set out for them. Now ask them how they could have broken the rule. For example they could have used more pipe cleaners. They could have worked together with someone else instead of working alone. They could have added other material to their creation besides the pipe cleaners and so on. Now ask participants to take the remaining pipe cleaners and make another hat, but to do so in a way that breaks the rules.

The big question here is how does traditional education prepare students for this kind of thinking? The answer is that to a large extent it doesn't. This is because traditional education is more about giving learners the kind of literacy skills, which while useful, as building blocks are still very often useless in the workplace. This is partly because educators have felt that by the time students leave school any job related skills might be obsolete. Nevertheless, Dr. Howard Gardner warns us in *The Unschooled Mind*, that if we don't do something to change the current situation, schools themselves will become obsolete.

A Kind of Education that is an Exception to the Rule

There is however one notable exception to the rule and that is the apprenticeship system. This is where people receive on job training under the watchful eye of an expert.

The apprentice receives instruction from an expert in a number of ways. First since he or she is more or less integrated into the organization from the first day, they are encouraged to participate through observation from the sidelines. This kind of participation is peripheral in the sense that they see what is happening at all times without necessarily being aware that they are doing so. Secondly, the apprentice is gradually drawn into doing increasingly more challenging tasks connected with job skills. And thirdly, the most important, he or she is given relevant and practical feedback on their job performance by the expert. The apprentice will be able to act upon this feedback immediately to improve their skills. The apprenticeship system fulfills Dr. Gardner's definition of teaching so as to acquire genuine understanding. Genuine

understanding for him is the capacity to create or perform something of value to the culture and society in which we live.

If we return to forward thinking again for a minute, it is interesting to note that experts in any given field are more likely to use forward thinking in problem solving. They tend to be more varied and flexible in the way they think and are thus able to move easily from backward to forward thinking according to the circumstances. This is what is needed in today's world, people who are innovative and creative thinkers able to challenge proven ways in order to find new ways of doing things

The Role of the Expert in Acquiring Thinking Skills

I mentioned above the role of the expert in the apprenticeship system of learning. A very good way for students to acquire thinking skills is by observing an expert. Next I'd like to analyze how thinking differs between experts and non-experts.

An example of this is the difference in the way a chess master and a novice remember chess positions. This difference lies in the size of "chunks" of information, which can be stored in the short-term memory or working memory of the expert. The expert will have larger chunks of information at his or her disposal whereas the novice will generally have one piece of information per chunk.

This is perfectly illustrated in the *window panning* technique. A windowpane is a drawing of a large rectangle divided into nine equal squares or windows. Each square represents a chunk of information. It follows the $-2 \ 7 +2$ principle of how the working brain is able to store information. This means that the working brain (short-term memory) is able to store around 7 chunks of information at any one time. The windowpane has nine windows so we can use anywhere from five to nine of them when information is memorized. Information to be learned is divided into chunks and written into the windows. Information is learned first sequentially and then randomly using the visual-spatial characteristics of the windowpane. In the beginning the chunks of information may be small. However with practice comes expertise and the ability to handle larger and larger chunks of information.

Research carried out at Harvard University also indicates that the expert's skills are largely confined to tasks in their domain and don't necessarily transfer to other skills. It has also been noted that experts are better at representations using diagrams or mental models. According to Dr. David Perkins co-director of the Graduate School of Education at Harvard University, The expert's key to success lies in practice. Practice seems to be the major independent variable in the acquisition of a skill. To understand this better, we can compare practice with experience.

Practice versus. Experience

Experience is about "time on task." Practice is about efforts to enhance one's ability over time. Generally this involves some kind of training. An example of this can be seen in playing the violin. Experience or "time on task" might account for the reasonable proficiency of an amateur violin player. Professional violinists need to spend a lot of time thinking about and mentally rehearsing their performance. They must also, like the apprentice, receive thoughtful and constructive feedback on technique. Practice entails developing knowledge. Such

knowledge enables the violinist to adapt their performance to the acoustics of different concert halls and the effect of weather on their violin. Thus the expert violinist is able to enhance their performance under variable circumstances.

If we return to the chess player, he or she might well accumulate up to 1,000 hours of practice time to become an expert. Along with practice time, the expert has the propensity to reflect on his own efforts. This may mean slowing down on his or her problem-solving process either during or after encountering a challenging situation. This allows for “active questioning” of one’s knowledge base, models, and theories.

Practical Interlude

In order to test this out, ask students to find someone they consider an “expert” in some area, which is of interest to them. Sit down with that person and ask them to explain to you how they do whatever it is that they are an “expert” in. This exchange can bring out strategies that the novice can use in order to move towards being an expert. Very often, however the “expert” will find it difficult to explain exactly how he or she became proficient in their area. Asking this person to reflect upon it is asking him or her to fulfill this essential requirement of “expertise”: reflecting on the process of becoming an expert.

The Role of Self-Assessment

Dr. Perkins co-director of the Harvard Graduate School of Education emphasizes that what education needs to be concerned with today is how to train people so that they are able to perform their jobs better and to live better. To do this, students need to be able to assess their own work. In the classroom the scenario would be very much like this. A class full of students is bent over essays in which they argue for and against wearing school uniforms. In preparation for this task they have interviewed teachers, other student’s parents, and administrators. In order to find out the important issues on each side of the case. The teacher has previously given the student a scoring rubric that lists the criteria for the essay. This includes all the elements needed to produce a good essay.

The criteria set down requires students to provide a clear and accurate treatment of the evidence to support their claim as well as a carefully written discussion of evidence that could weaken their claim and why it does not completely undermine it.

The students are in the process of assessing their own work on the essay. When they are done, they begin to revise their essays in order to build on its strengths and at the same time, eliminate its weaknesses. They are willing to revise because the scoring rubric provides clear directives for improvement. Several students ask the teacher for help. The teacher also checks the progress of one student who tends to overestimate his progress. Most students tend to be more severe in their evaluation than she is, so she lets them work on their own.

It is this self-assessment that can prompt some students to be more reflective and better able to control their own thinking in order to learn and think better. It follows that students who are better able to monitor and regulate their own thinking tend to be better at problem solving skills, writing, reading and even playing games. It also is apparent that teaching students to assess and revise their own work improves its quality.

Learning Thinking Skills

So, can thinking skills be taught at school? For an answer to this question we turn to *Project Intelligence* or *Odyssey*, as it is also known. This is a course that can easily fill a year and seeks to teach the kind of strategies students' need in order to be able to assess their own work. This course is built around critical thinking skills such as reasoning, problem solving, decision making, and inventive thinking.

Most courses designed to improve thinking teach strategies like the ones mentioned above. Strategies reorganize thinking by providing patterns to follow that work against thinking errors such as being too hasty, narrow or fuzzy reasoning and sprawling. The desired outcome here is to achieve metacognition. As used here this term refers to monitoring and managing one's own thinking. This includes making plans before beginning to think through a problem, regulating thinking during the time the problem is being solved and reflecting back afterwards to revise and plan how to think better in the future. This is what Dr. Perkins calls, "reflective intelligence". This includes the contribution of knowledge to thinking and reflective self-guidance to intelligent behavior. Any instructional efforts to enhance intelligence should seek to focus on reflective intelligence.

Dr R. Sternberg of Yale University famed for his research on emotional intelligence defines what he thinks are the qualities necessary to acquire good creative thinking skills. According to Dr. Sternberg it is important to know how long to persevere at a task. Sometimes it is better to know when to stop rather than stubbornly going on. While this is true for some people, others need to persevere longer to accomplish their outcome. It can, as was stated earlier, take years and years of practice in a domain to achieve success. The challenge is to know when to let go and when to persevere. People also need to feel motivated and dedicated to their work and to recognize the importance of teamwork. Interestingly enough, Dr. Sternberg notes extrinsic rewards like money can hinder long term development while intrinsic rewarding within itself can nurture long-term development. An intrinsic reward could be a level of challenge in balance with a level of skills.

Teamwork

Dr Sternberg also insists on the importance of teamwork. That is to have colleagues to call on when the unexpected happens and help is needed.

According to Sternberg having these qualities will be one of the key factors to success and well-being in the future.

Today organizations need people skilled in problem finding and creative thinking. In order to do this intelligence within the organization needs to be fostered. This can be done through the following: Making sure there is a flow of information within the organization. Since information technologies blur the historical roles of managers as thinkers and workers as laborers, a level of trust needs to exist, which permits an exchange of information and the willingness to ask colleagues for help. This is necessary when the normal chain of information flow is not effective or adaptable to the situation. This could be for example some kind of crisis situation out of the daily norm.

This means that team building has to become a part of everyone's training. This can be easily carried out in the classroom where co-operative learning would replace more competitive classroom activities.

Practical Interlude

Here is an example of a team building activity used on management training courses. Ask students to look around and collect some typical objects found in the classroom. Ask them to experiment with the sound these instruments make. Gradually they bring these sounds together to make a musical composition. They next find a way to note down their composition. This does not have to depend on musical notation but any form of symbols that will make the composition clear. The group finally performs their masterpiece.

Asking people in the workplace to work together to compose and then perform a musical composition is interesting if you stop and think that an orchestra performing a piece of music is often used as a metaphor for a well- run organization. The conductor is compared to the CEO while the players of the orchestra are compared to the workers in an organization. Each has their role whether large or small. Each one is vital for success.

There needs to be a degree of tolerance for experimentation.

Workers need freedom to work, play, and experiment and enter into dialogue with each other. There is a very good example of this in a computer software company that set up a flexi-system of work hours. Technicians sharing working hours with the management team were strongly discouraged from "playing around" with their computers during working hours. They were encouraged to be task orientated. They were definitely there to work.

Technicians who worked nighttime hours when there was no "management control" tended rather naturally to spend more time playing around with their computers and chatting with each other. They took the time to experiment with their programs and share their discoveries with each other. The management quickly noted that the night team came up with more innovative and original astute than the daytime team. The message was clear: if organizations want their workers to be creative, the workplace has to be conducive to creativity.

We can also take a lesson from the Japanese who do not leave thinking exclusively to managers and work-related tasks to workers. Also there doesn't seem to be the feeling that workers are unable to master their own jobs without assistance from above. The Japanese model instead relies heavily on the information-processing skills of its workers. This means that in Japanese organizations the workers are a viable and indispensable element. A quote taken from a Japanese quality control manual states that, "it is necessary to move away from the management style that emphasizes efficiency exclusively and instead recognizes the unlimited potential of human capabilities."

Conclusion

The work place is changing rapidly. This is due primarily to the introduction of more and more technology into our working lives. This means that instead of talking about individual intelligence there is a growing trend to speak of organizational intelligence. This means that

individuals will be asked to work together as a team to share and use their own unique skills and talents. Out of this sharing and blending comes organizational intelligence.

In order to prepare students for the workplace, schools need to be concerned about teaching learners the skills that will lead them to be successful and productive in their working lives and in their personal lives. These skills can be grouped around the concept of teaching students how to think creatively in such areas as problem solving, problem finding, reasoning, decision making, and reflective thinking which leads to self-assessment.

It also means that in the classroom we need to development co-operative learning and teamwork that will enable workers to have skills and willingness to work together to obtain a common outcome.

In order to accomplish the above, we can look around us for working models such as the apprenticeship system where trainees are encouraged to take a more and more active and complex role in the learning process. The outcome here is for the learner to be able to show genuine understanding through the production or creation of something that is of value to his community and culture.

Bonnie Tsai

Suggested Reading

The Unschooled Mind, Howard Gardner, Fontana Press 1993

Learnable Intelligence and Intelligent Learning, Heidi Goodrich and David Perkins

<http://www.pzweb.harvard.edu>

Practical Intelligence, Nature and Origins of Competence in the Everyday World, R.J. Sternberg and R.K. Wagner, C.U.P. 1986

In The Age of Smart Machines: The Future of Work and Power, S. Zuboff, Basic Books 1988

Practical Activities based on Multiple Intelligence

Four Ways of Perceiving Cultural Differences

Aim: To help participants make their attitudes towards the beliefs and behaviors of another culture explicit and conscious. This would be a means to work on both the interpersonal and the intrapersonal intelligence.

Preparation: In this preparation section we want to explain the “four ways” to you using personal examples so that you can then explain the four attitudes using examples of your own. Your personal examples will be much more useful.

The Evolutionist Upward state of mind: (*Upward Evolutionist* looking up to)

I admire the way Italians, Maltese, Greeks and Spanish people cook, with plenty of simple vegetables, pasta and olive oil. I admire their sense of timing and the idea of “slow food” and of sitting round a table chatting.

The North Mediterranean way of cooking and meal-socializing is superior to the way my English compatriots live in area. My mental state is one of admiration.

The Evolutionist downward state of mind (*Downward evolutionist* looking down on)

Many 30 year olds in the UK cover their garden with lawn and have a wooden deck near the house. They grow no flowers or vegetables. My 39 year old son does this and I feel a gardener’s contempt for him and his way of doing things. Yes, I look down on his way of using his garden.

This man feels his culture in this area of gardening is superior to his son’s. His son is one of many people in this same next generation. This man feels negative about the next generation’s way of using garden space. The state of mind is contempt.

The Universalist state of mind (*Universalist sameness*)

A man writes: There are women in some parts of Amazonia who wear almost nothing while women in Saudi tend to be covered from head to foot. There are teenage party goers in UK who show plenty midriff while in Tokyo skirts can be very short.

Sure, the customs are different across the world but the central thing for me is the beautiful, attractive female body that is being either hidden or revealed and that calls out to my male, primate, biological need. I see plenty difference, but it is only on the surface. Women attract me anyway, whatever the culturally governed wrapping or absence of it. This state of mind is about seeing sameness beyond apparent difference.

The Relativist state of mind (Relativist both OK)

In a shop in Italy I place my money in the money container on the counter between the assistant. Here in the UK, I put money into the assistant's hand.

My state of mind is relativist as I can produce either behavior in the correct cultural setting. Switching behaviors costs me nothing.

The above four states of mind are intended as descriptive frames. There is no feeling that one state of mind is "better" or "morally superior" to another.

Now prepare your own personal examples of the four states of mind.

How to use with a group:

1. Tell participants of a time when your state of mind was evolutionist upwards.

If appropriate give further examples.

2. Ask participants to work in fours and come up with times when they felt this way towards the mindset and behaviors of another cultural group in their country or abroad. It could be a different cultural sub-group within their extended family.

Bring some of the ideas from the groups into the plenary.

3. Follow the two steps above working on the other three cultural states of mind, kicking off with your own personal examples each time.

4. Round off the lesson by getting answers from round the group to this question: What is the most interesting thing you have found out about yourself in this lesson?

Acknowledgement: We met the above thinking/feeling frame in the work of Richard Shweder.

Rules for life

Do I always do what Mum said?

Aim: To give participants some level of awareness of how they acquired some of their own culture, how much of it they still accept and what part of it they would pass on to the next generation.

Preparation/materials for the trainer

Have ready a list of 'rules,' you were given as a child.

Procedure

Ask participants to write a list of all the 'good behavior rules' they were given by their parents/family/care givers, when they were children. (For example: You must give up your seat on the bus for an older person.)

Ask them to categorize the rules under the headings: nice but not important, important, very important

Put participants into small groups so that they can exchange this information. Allow a few minutes for this.

Next ask them to highlight 'rules which have changed' as your students have got older and ask them to tell their groups what the changes are.

After this, ask them to tell their groups which rules they would keep/have kept for their own children.

Finally ask them to exchange their 'rules for their children. If appropriate, open this discussion out to the whole class, focusing on the changes to the rules and what has brought these about.

Multiple Intelligence in Theory and in Practice

At the Harvard Graduate School of Education alongside Dr H. Gardner, Dr David Perkins has a somewhat different take on Intelligence and I believe this is important when we consider lifelong learning. While Dr. Gardner considers intelligence as a biopsychological potential-something we acquire at birth, Dr Perkins sees intelligence as having an experiential aspect. In other words, through experience we can “grow an intelligence” and make it stronger. Gardner’s use of entry points seems to confirm this. By working through our stronger intelligences we can bridge into intelligences which constitute our weaker areas. In this way I believe we can succeed in areas which we would be unable to do if we had tackled it directly through the one to which it would more logically belong.

As concerns lifelong learning, by developing critical thinking skills* so important in the application of MIT, I have found that learning goes far beyond succeeding on tests and exams or getting through the course. These skills equip us to continue to learn with joy all our lives.

** comparing and contrasting, relating facts, analysing, assessing, inferring, presenting evidence, generalizing, diagnosing, synthesizing, evaluating, creating models, explaining, theorizing, predicting, categorizing, defining distinction, judging, making connections, deciding, classifying/chunking, and making analogy*

Dr. Howard Gardiner of Harvard University says that there are many different kinds of intelligences. He has identified 9, but also says there may be many more. Here, intelligence is not defined as doing well on a test or memorizing lists of words, but as solving problems or creating something, which is of value to a culture. It means working collaboratively to accomplish a task. It means creating a product like turning clay into a lovely object, developing a new dance or writing a poem. The criteria for intelligence that Gardner sets forth are varied. The nine intelligences* he has defined are Interpersonal: The ability to understand people and relationships, Intrapersonal: Access to one's emotional life as a means to understand oneself and others, Bodily-Kinaesthetic: The ability to use the body skilfully and handle objects adroitly, Linguistic: Sensitivity to the meaning and order of words, Logical-Mathematical: The ability to handle chains of reasoning and to recognize patterns and order, Musical: Sensitivity to pitch, melody, rhythm and tone, Visual-Spatial: The ability to perceive the world accurately and re-create or transform aspects of the world, Biological-Natural: The ability to recognize flora and fauna, to make other consequential distinctions in the natural world and to use this ability productively. Existential: the ability to reflect upon questions of moral value.

The nine intelligences listed here are the ones Dr. Gardiner has actually published. There are of course many other possibilities. At one time Gardiner was working with up to 21. Emotional Intelligence, (Sternberg, 1996) is a highly developed form of Interpersonal/Intrapersonal Intelligence.

Learning styles are not intelligences

Learning styles and multiple intelligences are quite different. Although Multiple Intelligences (MI) is a modern developmental psychology theory closely linked to learning styles and constructivist theories (Battro, 2009), it differs from learning styles in that learning styles speak of the way a certain person consistently goes about learning something. For example an “auditory” second language learner wants to participate in discussions, conversations, and group work (Oxford, 1995), whereas “musical intelligence” actually leads to a discipline that is valued by a certain culture in a certain time period, such as a concert violinist. Krechevsky & Seidel (1998) give an example, “One can be a tactile or auditory learner and still become an accountant or a botanist. However, if one has not developed strong logical-mathematical or naturalist intelligences, success in those professions will be limited.” Different than a ‘style,’ an ‘intelligence’ is a biological potential situated in the brain of every human being which can be developed in a trajectory valued in a culture. Howard Gardner, the progenitor of MI Theory, has defined intelligence (1999) thus: “the bio psychological potential to process information that can be activated in a cultural setting to solve a problem or fashion a product that is valued in one or more cultural settings

The entry point approach

Whether a teacher uses MI theory or any learning styles theory to support their pre-defined aims, there are many approaches which engage the students. One approach that can be used in any setting is the Entry Point Approach, based on Multiple Intelligences. The Entry Point Approach is an approach to learning - a structure for designing curricula rather than a particular curricular vehicle. The notion of entry points was introduced by Howard Gardner in *The Unschooled Mind* (1991):

My own belief is that any rich, nourishing topic - any concept worth teaching - can be approached in at least five different ways that, roughly speaking, map onto the multiple intelligences. We might think of the topic as a room with at least five doors or entry points into it. Students vary as to which entry point is most appropriate for them and which routes are most comfortable to follow once they have gained initial access to the room. Awareness of these entry points can help the teacher introduce new materials in ways in which they can be easily grasped by a range of students; then, as students explore other entry points, they have the chance to develop those multiple perspectives that are the best antidote to stereotypical thinking (p. 245).

The framework features five different points of entry into any topic: the Aesthetic, the Narrative, the Logical/Quantitative, the Foundational, and the Experiential. Harvard project MUSE researchers initially suggested that by experiencing all five entry points, learners can discover: 1) if and when they prefer one entry point over another, and 2) that there are many different and valid ways to think and learn about any subject. Gardner (1991: 245, 1999: 169) outlines these entry points.

The Narrative “narrational” Window. In using a narrational entry point one presents a story or narrative, linguistic or filmic, about the concept in question. In the case of democracy, one

would tell the story of its beginnings in ancient Greece or, perhaps, of the origins of constitutional government in the United States.

The Logical/Quantitative “numerical” Window. In using a logical-quantitative entry point, one approaches the concept by invoking numerical considerations or deductive reasoning processes. In the case of democracy one could look at congressional voting patterns over time or the arguments used for and against democracy by the Founding Fathers.

The Foundational or “existential” Window. A foundational entry point examines the philosophical and terminological facets of the concept. A foundational approach to democracy would ponder the root meaning of the word, the relationship of democracy to other forms of decision making and government, and the reasons why one might adopt a democratic rather than an oligarchic approach.

The Experiential or “hands-on” Window. Many people can easily approach a topic through an activity in which they are fully engaged – building or manipulating materials, or carrying out experiments. In experimenting with democracy, learners might constitute groups that have to make decisions in accordance with various governmental processes, observing the pros and cons of democracy as compared with other, more “top-down” forms of government.

The Aesthetic Window. Some are inspired easily by works of art or music, which feature balance, harmony, and composition. In approaching democracy, learners might look at a painting depicting a scene from the Revolutionary War and contemplate on whether the colors and characters of the American revolutionaries are more or less ‘democratic’ than the British soldiers (my example). One intriguing approach would be to listen to musical ensembles that are characterized either by group playing or by laying under the control of a single individual - the string quartet versus the orchestra (Gardner’s example).

Although there is an important synergy between them, with each schema having implications for the other, the structures differ in their specific area of illumination. In sum, MI theory may be more useful in considering students (those who are learning), and the Entry Point Approach may be more useful in considering text (what is being learned).

Obviously I have been convinced by the relevance of MIT both in improving the quality of teaching and learning. I have seen the results and they are impressive.

Here are some of the observations and experiences I have had using MI:

- A focus on fun, with problem-solving and learning how to learn. Fun and energy are created through the planned use of games and active exercises
- People are there voluntarily, the atmosphere is relaxed and interactive. Young people are engaged in deciding the appropriate behaviours and attitudes and adults are enskilled to model these and encourage others to lead by example.
- A real ‘life’ challenge with a real purpose, if possible presented by an expert or local leader
- Learners question the challenge in order to plan how to meet it, taking responsibility for their own learning and how best to go about it

- A focus on building positive relationships and energy between participants
creating flow so that everyone is totally absorbed in the activity.
- Teamwork to create learning teams of adults and young people who learn together and from each other
- Peer coaches are a critical part of the learning team and exercise leadership
- Goal-setting, forward planning, creative and problem-solving tools, reflection and review are part of the daily programme

Using Howard Gardner's model of multiple intelligences as a starting point we ask people to consider their strengths and how they might best use them in meeting the challenge

Celebrating the challenge through producing the final product, presenting, performing, and display. Celebrating the learning on the last day and putting some thought into it is a big part of the challenge framework.

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Multiple Intelligence Chart



How children learn

Children don't learn the same way at each stage. Verbal/Linguistic intelligence is at its strongest at Kindergarten through third grade. (8 years old) Logical/Mathematical is at its strongest from the age of 6 through 9. Kinesthetic and Visual/Spatial intelligences remain dominant throughout primary school. This means that presenting information through visual and active learning experience works best in the primary grades.

In the middle school the Bodily/Kinesthetic, Visual/Spatial, Musical/Rhythmic and the Interpersonal intelligences are dominant. These students are more likely to do well working together than working alone.

A Snapshot of How Children Learn

Age	Picture Smart	Word Smart	Body Smart	Self-Smart	People Smart	Music Smart	Number Smart
4-5	X	X	X	X		X	
6	X	X	X				X
7	X	X	X				X
8	X	X	X		X		
9	X		X		X	X	
10	X		X		X	X	
11	X		X		X	X	

Intelligence profile

Intelligences were grouped into 4 windows:

1. Logical, intrapersonal, existential
2. Visual/Spatial, naturalistic
3. Kinesthetic, interpersonal
4. Verbal/linguistic, musical

These intelligences often work together. This was very apparent in the week course with participants who used the Logical, intrapersonal, and existential intelligence and one person who was strongly kinesthetic, interpersonal.

Through constant observation of choices made and the way activities were prepared and presented, it was possible to determine dominant intelligences. It gets away from the incorrect idea that there is one intelligence that is dominant in each person. This chart makes it clear how intelligences work together. It also makes it easier for the trainer to prepare activities because it is difficult if not impossible to work with only one intelligence.