Intelligence Quotient (IQ): origins (Gardner, *MI: New Horizons*, ’06)

- Paris, 1900, La Belle Epoque: Families were flocking to the city from the provinces; many were having difficulty with school work.
- Alfred Binet was approached to devise a measure that would predict which youngsters would succeed and which would fail in the primary grades of Paris schools.
Binet’s discovery came to be called the “intelligence test”, his measure, the IQ, for “intelligence quotient” (mental age divided by chronological age and multiplied by 100).

Like other Parisian fashions, the IQ soon made its way to the US, where it enjoyed modest success until World War 1, when it was used to test over a million military recruits.
Intelligence seemed to be quantifiable. Just as you could measure someone’s height, you could measure someone’s actual or potential intelligence. There was one dimension of mental ability along which we could array everyone. Gardner presents a radically different view of the mind, recognising different and discrete facets of cognition, acknowledging that people have different cognitive strengths and contrasting cognitive styles (pps.3-5)
Howard Gardner’s Theory of Multiple Intelligences

- The idea that intelligence is fixed, that the brain changes its architecture only in early life, and that all brain damage is permanent, belongs to the past. Evidence abounds that throughout life, the human brain restructures itself according to what it learns. .... The concept of plasticity offers hope to educators, who impart the importance of lifelong learning to students.

*(Educational Leadership* Nov. 2001)
“Notions about intelligence vary over time, across cultures and even within cultures. Definitions of intelligence depend on whom you ask, their methods and levels of study, and their values and beliefs. Definitions are associated with the needs and purposes of different cultures”. Note, for example, the different words in the Irish language for intelligent (éirimiúil; cliste; glic; críonna; stuama; tuisceanach; intleachtúil).
Intelligence in different cultures (from Kornhaber)

- Industrialised **North Americans** tend to associate intelligence with speedy answers.
- Rural members of the **Baganda tribe** in Uganda think of intelligence as slow, careful, active, straightforward, sane.
- In the **Mashona tribe** in Zimbabwe, the intelligent person exercises prudence and caution especially in social interaction.
- For the **Kipsigis** of Kenya their word for intelligence includes social responsibility.
Howard Gardner’s Theory of Multiple Intelligences

Thinking about intellect and intelligence has been influenced in recent decades by

- *New technologies such as the computer*
- *Brain research (aided by technologies such as MRI scanners etc)*
- *Studies about the use of the mind in different cultures and contexts (anthropology)*
- *Interpretation and re-interpretation of research findings about knowing and learning*
Howard Gardner’s Theory of Multiple Intelligences

In the past few decades, the traditional view of Intelligence has been challenged by a number of researchers, including Howard Gardner. His theory of Multiple Intelligences challenges the traditional “dipstick” view of intelligence as a unitary and fixed capacity that can be adequately measured by IQ tests.
MI challenges IQ as follows: (Kornhaber, Fierros & Veenema, 2004)

- MI maintains that several intelligences are at work, not just one
- Intelligence is expressed in our performances, products and ideas; not through a test score
- How the intelligences are expressed is culturally defined.

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IQ: implications

- The traditional psychological view was based largely on studies of mental tests.
- Accordingly, all human problem solving is governed by one underlying mental ability- known as general intelligence or \( g \).
- Gardner’s years of research in the arts, developmental psychology and neuro-psychology led him to doubt \( g \).
G: implications

- If g governed all problem solving, then young children should show the same rate of intellectual development in mastering language skills, drawing, maths... Yet development occurs at different rates. Children develop sophisticated language skills faster than sophisticated maths skills. If g prevailed, then child prodigies should excel across the board, in music as well as painting - but no defined pattern exists - they excel in 1-2
**G : implications**

- If g were the rule, then autistic savants or stroke victims should have weak capacities across the board. Yet there are brain-damaged people who can play music beautifully but who are severely impaired in their use of language; there are others who can communicate well but who can’t solve basic maths problems.
Implications continued:

• Gardner’s definition suggests a qualitative expression, a description, of an individual’s collection of intelligences, rather than a single, quantitative expression of a set of narrowly defined paper and pencil tests (Baum, Viens and Slatin, 2001).
“The daily opportunity to work with children and with brain damaged adults impressed me with one brute fact of human nature:

People have a wide range of capacities. A person’s strength in one area of performance simply does not predict any comparable strengths in other areas” (1999, 31).
Gardner: observation 2

“...In most cases, strengths are distributed in a skewed fashion...a person may be skilled in foreign languages, yet be unable to find her way around an unfamiliar environment or to learn a new song. Likewise, weakness in learning foreign languages does not predict either success or failure with most other cognitive tasks” (1999, 31).
Gardner’s conclusion:

“The human mind is better thought of as a series of relatively separate faculties, with only loose and non-predictable relations with one another, than a single, all purpose machine that performs steadily at a certain horsepower, independent of content and context” (1999, 32).
Howard Gardner’s Theory of Multiple Intelligences

- Gardner originally (*Frames of Mind, 1983*) offered the following definition of intelligence:

  - “the ability to solve problems or to create products that are valued within one or more cultural settings”.

- In his 1999 book *Intelligence Reframed - Multiple Intelligences for the 21st Century*, Gardner refines the definition as follows:

  - “a biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture”

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Implications of definition

- Intelligence represents potential that will or will not be brought to bear depending on the values, available opportunities, as well as personal decisions made by individuals, of a particular culture (1999, 34).
- Gardner locates intelligence in what people can do and the products they create in the real world.
Gardner’s approach

Gardner began with a different question:
What are the mental abilities that support the wide range of adult roles found over time and across cultures?
What abilities enable people to become teachers, carpenters, musicians, farmers?
Intelligence as a capacity in the human brain that is developed in social & cultural contexts
Multiple Intelligences

- Naturalist
- Musical
- Bodily-Kinesthetic
- Logical-Mathematical
- Linguistic
- Interpersonal
- Spatial
- Intrapersonal

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Linguistic

- Capacity to use words effectively, both orally and in written form.
- Ability to manipulate the structure, phonology semantics and pragmatic dimensions of language.
- Journalists, poets, playwrights, public speakers.....

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Logical Mathematical

- Capacity with numbers, logical patterns and relationships.
- Use of categorisation, classification, calculation and hypothesis testing.
- Mathematicians, accountants, statisticians, scientists...
Spatial

- Ability to perceive the visual spatial world accurately.
- Sensitivity to colour, line, shape, form and space.
- Ability to orient oneself in a spatial matrix.
- Architects, artists, inventors, designers...
Bodily Kinaesthetic

- Show expertise in using one’s body to express ideas and feelings.
- Ability to use one’s hands to produce or transform things as a sculptor, mechanic or surgeon.
- Co-ordination, dexterity, flexibility.
- Proprioceptive, tactile and haptic capacities.

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Musical

- **Perceive** musical forms as a music aficionado.
- **Discriminate** as a music critic.
- **Transform** as a composer.
- Express as a performer.
- *Have one’s life enriched by music.*
Interpersonal

*Ability to perceive and make distinctions in the *moods*, *intentions* *motivations* and *feelings* of other people.*

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Intrapersonal

- Having an accurate picture of one’s strengths and limitations.
- An awareness of one’s inner moods, intentions, motivations and desires.
- High degree of self-knowledge.
- Ability to act adaptively on the basis on one’s self-knowledge.

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Naturalist

- Ability to function well in the natural environment.
- The recognition and categorisation of natural objects.
Howard Gardner’s Theory of Multiple Intelligences

In developing his theory, Gardner drew upon findings from
- evolutionary biology
- anthropology
- developmental and cognitive psychology
- Neuro-psychology
- psychometrics
Howard Gardner’s Theory of Multiple Intelligences

Gardner used eight different criteria to judge whether a candidate ability can be counted as an intelligence:

1. potential of isolation by brain damage
2. existence of savants, prodigies etc.
3. an identifiable core operation or core operations
4. support from experimental psychological tasks
5. support from psychometric findings
6. a distinctive developmental history with a definable set of expert end-state performances
7. evolutionary plausibility
8. susceptibility to encoding in a symbol system.
## Howard Gardner’s Theory of Multiple Intelligences

<table>
<thead>
<tr>
<th>INTELLIGENCE</th>
<th>CORE OPERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td>syntax, phonology, semantics</td>
</tr>
<tr>
<td>Musical</td>
<td>pitch, rhythm and timbre</td>
</tr>
<tr>
<td>Logical-Mathematical</td>
<td>number, categorisation, relations</td>
</tr>
<tr>
<td>Spatial</td>
<td>accurate mental visualisation</td>
</tr>
<tr>
<td>Bodily-kinesthetic</td>
<td>control of one’s own body</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>awareness of others’ feelings, etc.</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>awareness of one’s own feelings</td>
</tr>
<tr>
<td>Naturalist</td>
<td>recognition and classification of objects in the environment</td>
</tr>
</tbody>
</table>

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Howard Gardner’s Theory of Multiple Intelligences

Individuals are never endowed solely with one intelligence. Rather, all brain-unimpaired people possess all the intelligences, which they blend in various ways in the course of creating something that is meaningful or performing a meaningful role or task.
MI-key features

- based on real-world intelligence
- pluralistic view of intelligence
- all intelligences are universal
- intelligences are educable
- unique profiles of, that develop & change
- each involves sub-abilities/manifestations
- they work in combination, not isolation
All 8 (or more) intelligences are universal

- MI theory posits that intelligence originates biologically. The 8 have been identified in all known cultures. As humans all individuals have potential in all the intelligences. In practice, this feature reminds us that every student in every classroom brings to bear a collection of all 8, each to varying degrees of strength.
Individuals possess unique profiles of intelligence

Although MI theory claims a biological basis for intelligence, this does not suggest that intelligence is purely genetic and inherited. From the perspective of “nature”, we are all at promise for all the intelligences. How and to what extent the intelligences manifest themselves depend on “nurture” to a significant extent. (17)
Intelligences are educable

As a constant interaction among biological and environmental factors, intelligences are educable, they change and grow. The more time students spend using an intelligence, the better the instruction and resources, the smarter he becomes in that area. In practice, all children can learn. This works against labelling and excluding.

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Learnable Intelligence (Goodrich, Perkins, 1998, Chap. 4)

- The conception of intelligence presented here is less concerned with standard measures of IQ than with the practical side of intelligence - the kind that allows people to learn better, to perform their jobs better, to live better. As applied to school-based teaching and learning, the research on learnable intelligence has 2 claims:
Claims re learnable intelligence/ intelligent learning

- Students can be taught to behave more intelligently
- Teaching for intelligence can lead to improvements in academic achievement
- Teaching for intelligence and covering the curriculum need not be conflicting endeavours (Goodrich, Andrade & Perkins, 68)
Characteristics of intelligence

These include: solving problems well, reasoning clearly, thinking logically, using a good vocabulary, drawing on a large store of information, balancing information, sustaining a goal orientation, and showing intelligence in practical, not just academic ways... People judged intelligent by our culture know a lot and think well with what they know. This puts them in a better position to learn more. (Goodrich, 70)
Perkins (1995) 3 trends in psychological resources

- **A neural viewpoint:** this identifies intelligence with IQ. We can’t teach this kind of intelligence in any straightforward way. True changes in this model have a basic physiological character. Efforts to teach intelligence in the sense of raising IQ have shown limited success & favour high testing (Brody, 1992, Hernstein and Murray, 1994, Jensen, 1983) in Goodrich/Perkins, p. 71
Experiential & reflective viewpoints: learnable intelligence

- **Experiential view**: prior knowledge and experience in an area are excellent preparation for further learning, providing the learner with hooks for knowledge.

- **Reflective view**: intelligence consists of good mental management: Abby thinks and learns better than Betty because she attends to her thinking, monitors it, directs and redirects it. She resists impulsiveness, brainstorms options...
Implications for practice

There is no “right way” to apply MI theory, because it is a descriptive theory, not a pedagogical framework. But for many educators, the theory confirms what they have always believed: that students possess a range of abilities that school neither acknowledges nor develops. So educators accepted the challenge of creating applications for MI.
Implications for practice

“"I have always believed that the heart of the MI perspective - in theory and in practice - inheres in taking human differences seriously. At the theoretical level, one acknowledges that all individuals cannot be profitably arrayed on a single intellectual dimension. At the practical level, one acknowledges that any uniform approach is likely to serve only a minority of children”.

Implications for practice

- Those interested in MI must first state their educational goals and values. Only when educators clearly state and agree upon these larger goals - to teach for understanding, to prepare individuals for the world beyond school, to develop each person’s potential fully and to make sure that students master core knowledge - does it make good sense to ask - Can MI be useful in pursuit of this goal? If so, how?

Implications for practice (PZC, 1998)

*Educators find the theory useful for a variety of reasons:*

- MI fits with existing philosophies and practices
- MI validates what teachers / tutors already know and do
- MI provides a framework for thinking about practice
- MI helps teachers to extend their practice
- MI provides a vocabulary ... for self-reflection and ... collegial discussion
- MI promotes or justifies education in diverse art forms
Implications for Practice

- Using MI theory leads teachers to offer a greater variety of learning activities.
- The most engaging MI-based lessons use content and approaches that are meaningful to study.
- MI-based approaches advance learning goals.
- Implementing MI-informed practices involves teachers taking risks.
- MI-informed learning activities increase student initiative and control over the content or direction of the activities and they this become better learners. (Baum, Viens and Slatin, 2001)
Implications for practice

“In terms of teaching and learning, MI theory concentrates our minds on the fact that we need to address the plurality of the child’s intellect. ..... If we truly accept and value the theory of MI, then we are obliged as teachers to be far more inventive in our teaching. We must search for and develop methodologies that will allow all intelligences to shine in the learning experience. It means that we cannot go back to the hierarchical structure of teaching, rather we must grasp the notion of constructivism with both hands and give the students the freedom to explore and construct knowledge and understanding, beginning with their own strengths”. (Hyland (ed.) Final Report MI Project, 2000, p. 126)
Implications for practice

The most important educational implication of MI theory is this:

“We all have different kinds of minds, and the good teacher tries to address each student’s mind as directly and personally as possible. The more that we can match learners to congenial approaches to teaching, learning and assessing, the more likely it is that they will achieve educational success. Students should be provided with different ‘entry points’ to learning and given an opportunity to demonstrate understanding through authentic forms of assessment.

We can have explicit educational goals but we should be willing and able to approach them by multiple means”.

(PZClassroom: adapted from Interview with Gardner)
Entry Points- useful when planning lessons and strategies

An entry point is about finding a way to engage the student and to place her centrally within a topic... Entry points open up the conversation...An entry point perspective places students directly at the centre of a disciplinary topic, arousing their interests and securing cognitive commitment for further exploration.

(Gardner, 1999. *Intelligence Reframed*).

Gardner has identified at least seven- but there is no formula for generating promising entry points - a differentiated approach is required to reach the widest number of students possible.
Narrational Entry Point

- This entry point addresses students who enjoy learning about topics through stories.
- Present a story about the material to be learned. Activates the linguistic and personal intelligences.
- Also includes work with mime and film.
School: the Look of Learning - Glucksman Gallery, UCC

What story does this desk tell about how we engage our students?

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Quantitative and Logical

- Quantitative: This speaks to students who are intrigued by numbers and the patterns they make, their classifications and various operations.
  - It includes insights into size, ratio and change.
  - Uses deductive reasoning processes or numerical considerations.
- Logical: This entry point galvanizes the human capacity to think deductively.
  - Related to an interest in numbers, but centres round the interrelations and implications of logical propositions

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This entry point appeals to students who are attracted to fundamental kinds of questions. Nearly all children raise such questions, usually through myths or art; the more philosophically oriented pose questions and argue about them verbally.

Includes questions about life and death, who we are and what we are.
Aesthetic

- Some people are inspired by works of art or by materials arranged in ways that feature balance, harmony and composition.
- Emphasis on surface or sensory features of a topic is particularly successful with younger children.
- Key ideas and examples also have aesthetic properties and it may be a useful entry-point to history or literature.
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Key ideas and examples also have aesthetic properties and it may be a useful entry point to history or literature.
Experiential/Hands on

- Deals directly with the materials that embody or convey the concept of what is being studied.
- Very effective for young people who are stimulated by the opportunity to work with concrete materials.
Participatory/Interpersonal / Social

- Many people learn more effectively in a group setting, where they can assume different roles, observe others’ perspectives, interact regularly and complement one another.
- Using group work, a teacher may generate rich feedback through the use of well thought out performances of understanding and skillful questioning.
- Using this entry point we encourage individuals to work together, where their strengths can complement one another.
- Projects provide a valuable opportunity to use this approach.
Relating MI to your classroom practice

- What are the implications of MI theory for your teaching and student learning?
- Explore a promising entry point for your subject area and comment on how you think it “opens up the conversation” re the topic in question.
- What are the implications of the idea of learnable intelligence for your planning?
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