Multilingual Education and the Psycho-Socio-Neurolinguistic Paradigm...

How to Improve (Language) Education in a Sustainable way

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Outline

1. Education and the New Paradigm…

2. The Importance of Multilingual Education…

3. Research results and its implications…

4. The Next Steps For Italy…

5. Conclusions
Education and the new paradigm

New developments

• The *teacher* is not as omnipotent as was thought before ...
• The *method* is not as powerful as was thought before ...
• *Remedial teaching* is questioned as a way to empower pupils ...
• The *learner* is now thought to be more important than before ...

• *Methods* should be adapted to the learner’s capabilities ...

• Remedial teaching is often replaced by innovative techniques such as *empowerment*
As a result, the learner is rapidly replacing the teacher as the primary focus of attention.

This leads to a reconsideration of educational practices.

Attention is shifting to general (language) learning processes.
Attitudes towards language learning throughout the 20th century:

– Until +/- 1960 : nobody really cares.

– After +/- 1960 : language learning is to be distinguished from any other kind of learning (cf. Chomsky 1965, 1972, 1980).

– But also : learning, including language learning, is a complex matter (cf. Hill 1964, 1980).
Hill (Hill 1980) claims that a learning theory has

(i) to deal with the complexities of human symbolic learning and insightful problem solving
(ii) to allow for the flexibility of behaviour
(iii) to explain cognitive flexibility and its far from universal aspects
(iv) to take into account developmental processes
(v) to consider the influence of earlier on later learning
(vi) to deal with motivation and reinforcement
The importance of multilingual education

The interest of education in bi/multilingualism is a *from rags-to-riches* story…

– **Before 1962** : bilingualism is considered a *handicap* (cf. Darcy 1953, Carrow 1957)

– **1962** : *balanced bilinguals* can outperform monolinguals (cf. Peal & Lambert 1962)

– **After 1962** : lots of studies *appreciating* bilingualism (cf. Cummins 1984)

The importance of multilingual education

Major research questions:

- *in what way* can (language) learning (pedagogy) *positively influence learners’ results*…?
- in a way compatible with *developmental aspects as described by the neurosciences*…?
- in line with the *political recommendations* issued by the European Commission…?
- aiming at *sustainable development* of European citizens in a knowledge society?
The importance of multilingual education

• (Language) learning is mainly an *interaction process* between incidental and/or implicit activities vs. intentional and/or explicit ones (cf. DeKeyser 2003; Hulstijn 2003).

• Learning more than one language at the same time has *implications for the cognitive abilities* of young pupils (cf. Bialystok 2005).

• These cognitive abilities have *neural correlates* in the brain (cf. Fabbro 1999, Edelman & Tononi 2000, Bialystok *et al.* 2005, Mondt 2005).
The European Union has adopted multilingual education as one of its core policy items (cf. Commission 2005, High Level Group 2007, Group of Intellectuals 2008).

**Content and Language Integrated Learning (CLIL):** a dual approach whereby the curriculum is taught in two languages (Coyle et al. 2010).

Scientific issues such as **the processes underlying CLIL learning and the effects of CLIL learning** at different levels of education, is the subject of the research (Van de Craen 2007 et al. a,b,c).
A simple definition: “CLIL is a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language”

(Coyle et al. 2010:1)

Furthermore:

(i) It is good to start early… (cf. Gladwell 2008)
(ii) Make use of implicit learning… (cf. Reber 1993)
(iii) It does help learners in a scaffolding-like way… (cf. Bruner 1997)
(iv) Expect a different kind of learner… (cf. Van de Craen et al. 2013)
Aspects of CLIL…

– A *generic* term…
– indicating that *part* of the *curriculum* is *taught* and *learned implicitly* in another language than the *school language*…
– preferably - but not necessarily - by a *native speaker*…
– during a - preferably - *long period of time*…
– starting at a *young age*…
CLIL in Europe

- CLIL is implemented in nearly all European countries
- Acceptance and implementation are often a product of the historical and economic evolution of a particular country or region...
- Important parameters include standardisation, dominance, threats and legislation… (Van de Craen et al. 2013)

Examples...
- France...
- Italy...
- Belgium...
- Estonia...

- Results are strikingly different from traditional language classes and reach out beyond languages…
Two regions boast remarkable results…

• Spain: since 2004-2005 a *remarkable evolution* has taken place, in *Castilian-speaking areas, such as Andalucía and the Madrid area* …

• Wallonia, Belgian: since 1998 CLIL schools are organized in primary and secondary education with *increasing popular and scholastic success*…
CLIL in Europe: what difference does it make?
CLIL in Europe: what difference does it make?
In the past, learning processes were mainly considered as

- *formal learning processes*
- *explicit, intentional learning* was the focus…
- much *less attention* was paid to other forms of learning…

However…
The Learning Issue
Observations

• Young children often learn very successfully in an implicit and in an incidental way: languages, music, chess…

• There are a number of aspects that adults seem to learn with great difficulty such as pronunciation, accents, how to use a computer,…

Also

• Adults with learning experience learn faster and more efficiently than non-experienced learners…

• Sometimes adults learn more quickly than children…

Conclusion: there is a need for the scientific study of learning processes
• **New ideas...**
• **New technologies...**
• **New stakeholders...**
  – IMBES (International Mind, Brain and Education Society)...

• **Knowledge about brain functioning has not been recognized in (language) pedagogy...**
CLIL is **NOT**

- a *method*… but an *approach* to language learning and teaching…
- a *miraculous* approach…

CLIL **IS**

- an approach in line with the *best theories* of (language) learning available today…
CLIL: Background

• A general feeling that *traditional methods do not* work well...
• A growing *demand for language knowledge* due to societal changes…
• *New stakeholders* who are more interested in practical results than in theoretical knowledge (cf. economy driven)…
• The importance of a more or less united Europe where *mobility and means of communication* are essential (cf. policy driven)…
• *Opportunities for educational change* …
• *Opportunities for learner’s empowerment*…
• Opportunities for a *new scientifically based (learning) paradigm*…
Six major research questions with respect to

1. ... the target language
2. ... the mother tongue
3. ... subject matter knowledge
4. ... attitudes and motivation
5. ... cognitive development
6. ... brain development
1. The target language

- On the whole *better mastered* than with traditional methods…
- Especially on the *pragmatic level*…
- Reading and writing (if implemented) *level comparable to native speakers*…(with young learners)
2. The mother tongue

• … is not in jeopardy…

• Despite the fact that fewer hours are devoted to its ‘study’…

• Explanation: $100 - 20 = 80$ isn’t it? However $100 + 20 = 120$…

• A case of additive bi/multilingualism
3. Subject matter knowledge

• No signs that subject matter knowledge is of any less quality in CLIL than in traditional schools…

• However…
  • measures to ensure this result
  • the principle of repetition is a good candidate
4. Attitudes and motivation

- **Research** shows that *young pupils adore this approach*, also secondary school children are *very positive*... (Van de Craen *et al.* 2008, Lasagabaster & Sierre 2009, Dalton-Puffer *et al.* 2009)

- **Explanation:**
  - it’s all about *recognition*...
  - example: primary school with three groups of pupils: speakers of L1, speakers of L2, speakers of other languages, including migrant languages ...
5. Cognition

- Remarkable research results in Finland, Belgium, Spain and Ireland (Jäppinen 2005, Van de Craen et al. 2007a,b,c 2008, Lorenzo et al. 2009, Murray 2010).
- A cognitive added-value found in CLIL pupils...
- A better learning aptitude...
- And better learning pupils...
- In fact: weak learners become stronger and stronger learners remain strong...
Results of a calibrated math test in three primary schools in Brussels after four years of CLIL (two hours a week) working with different subject matter and compared to a control school (Van de Craen et al. 2005)
Comparison of math results at first year secondary school level between +CLIL vs. – CLIL pupils (13-year-olds) (see Surmont 2015)
CLIL: Research Questions and Results Related to Maths

• **CLIL pupils score better** for nearly all subtests …
• Also in schools that have *not* been working with maths.
• The differences between schools *decrease* if the subtests are less language related…
• The more complex the subtests are – *factions, problems, geometry* – the more outspoken the differences are…

6. **Brain development**

- Brains of bilinguals *evolve differently*
- This is already clear in infants. They are capable to distinguish between
  - *rhythm of languages*
  - *sounds of languages*
- At 7 months of age bilingual infants react better to visual stimuli than monolinguals
A new-born brain, left, a six-year-old one, middle, a 25-year-old one, right (cf. Carter 1998 : 18)
A Quick Look at the Brain

The somatosensory cortex (Penfield & Roberts 1959)
A Quick Look at the Brain

- Neural connections made through *interaction*...

- Learning a particular activity develops specific *neuronal substrates* ... E.g. piano players, taxi drivers, medical students, chess players, language learners

- The development of the brain can be influenced by *external factors*. Learning is the most important external factor in human development (cf. Blakemore & Frith 2005).
• Learning equals *the creation of connections* by the brain through activity…
• Showing knowledge is *recreating* these connections…
• **How to access knowledge?** (cf. Van de Craen 2005)
  – Like in a chest of drawers?
  – On a hard disc like in a computer?
• Memory experiment…
A Quick Look at the Brain

The hippocampus
A Quick Look at the Brain

• Knowledge *is not readily available* in the brain like a book in a library or a file on a computer…
• The right *connections* have to appear at the right time…
• Sometimes this process *fails*…
  – fatigue …
  – alcohol, drugs …
  – pathologies like Alzheimer, …
The *London taxi driver experiment*

- Great demand on memory…
- Research: size of their hippocampus?

> *London taxi drivers have a larger hippocampus than control groups* (Maguire *et al.* 1997, 2000)
A Quick Look at the Brain

Monolinguals (school language)

Early, highly proficient bilinguals

Early-late, proficient bilinguals in school language

(Data from Mondt et al, 2008, 2011)
• Learning equals the *creation of connections* in the brain…

• Learning is *good* for the brain…

• The more *stimulating* learning processes are, the more pleased the brain is… and the more *connections* will be made…
Neuronal convergence

(cf. Kim et al. 1997)
• There is a **striking difference** in the brain work load of monolinguals, bilinguals and school bilinguals while carrying out a *simple calculation task*…

• This result coincides with the idea of a **different brain** in early bilinguals compared to monolinguals…

• This result also **corroborates** the results of cognitive tests…
The CLIL experience evokes interesting language pedagogical insights important to general (language) education…

Three aspects:

1. How come CLIL works?
2. Learning to read and dyslexia
3. The principle of repetition
1. How Come CLIL Works?

Language pedagogical considerations:
- CLIL is about communicative (language) teaching
- Features of communicative (language) teaching:
  - really communicative
  - inherently repetitive
  - functionally pragmatic

(CLattenton & Segalowitz 2005)

CLIL is *necessarily* communicative…
Implicit learning: “[complex information] is [learned] without complete verbalisable knowledge of what is learned” (Seger 1994:164).

Characteristics of implicit learning are… (Reber 1993)
- robust…
- less prone to variation…
- more adapted to group learning…
- IQ independent…
- age independent …

(cf. learning how to play an instrument …)
1. How Come CLIL Works?
1. How Come CLIL Works?

Implicit learning results. See

https://www.youtube.com/watch?v=omuYi2Vhgjo
2. Learning to read and dyslexia

- Which language to choose from at primary school level: the *target language or the mother tongue*?
  - Two types of languages in Europe
    - ‘Difficult’ ones: English, French, Portuguese, Danish, ...
    - ‘Easy’ ones: Spanish, Dutch, Greek, Italian, ...
    (cf. Seymour *et al.* 2003, Goshwami 2008)

- CLIL pupils who learned to read in an easy language become *better readers* in the more difficult language even if that is their mother tongue...
2. Learning to read and dyslexia

- Dyslectic children often show *impaired motor development*. Equilibrium exercises stimulating the *cerebellum* may help (see Nicolson *et al.* 2001)

- Surprisingly, CLIL schools report *few cases of dyslexia*…

- Implicit *motor activities have a stimulating effect on the cerebellum* (see Matsamura *et al.* 2004)

- If we accept that implicit language learning is a form of motor learning, then this would mean that *CLIL works as a barrier against dyslexia*…
2. Reading and dyslexia
2. Learning to read and dyslexia

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3. The Principle of Repetition

The principle of repetition …

- The best results are obtained when subject matter is repeated in the two languages used by the CLIL approach.
- This is true in primary as well as in secondary schools.
- Repetition is an essential part of any learning process.
- However, teachers need to be reassured about the merits of new learning approaches (Pavón & Rubio 2010).
• **CLIL experience** in Italy: Val d’Aoste, South Tirol,…

• Very **challenging** and **ambitious** new regulations: to teach *una disciplina non linguistica in lingua straniera* from the third year onward (secondary school) and from the fourth year *another discipline in a different foreign language*…

• Pilot studies Grandinetti *et al.* 2013, Di Martino & Di Sabato 2012, one special case: Progetto Lingue Lombardia 2007)
The next steps for Italian Education

• Grandinetti et al 2013 (Calabria) : good results can be obtained but *careful collaboration is needed*...

• Di Martino & Di Sabato 2012 (Naples) : *very few, if any, content teachers are prepared*...

• Positive reactions by teachers in Lombardy but they received some form of CLIL training…
The next steps for Italian Education

• The introduction of CLIL is something *positive*

• However, *doubts* with respect to the benefits pointed out in this talk because

(i) *of the late starting age*…
(ii) *teachers seem not fully prepared regarding*

- *the mastery of the target language*…
- *the familiarity of CLIL methodology*…
- *the CLIL implications for learning*…

The right direction has been found but roads still have to be built in order to travel smoothly
Towards a New Paradigm

- CLIL creates a powerful learning environment resulting from an implicit learning approach...
- It empowers learners...
- It shows interesting (language) pedagogical innovations and insights...
- It shows better results than any other approach or method...
- CLIL equals innovative education because it positively influences cognitive and brain development...
Conclusion

CLIL is a story about innovative education…

- related to brain development…
- language pedagogy becomes a scientific research subject aimed at empowering the learner…
- creating a new kind of learner…
- applying autonomous and cooperative learning…
- inherently cognitively stimulating…
- in line with European language policy…
Grazie per l'attenzione

Thank you for your attention

Merci de votre attention

Ich danke Ihnen für Ihre Aufmerksamkeit