Disciplinary Literacy: A research overview

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Overview

Presentation for two types of people:

Content teachers

Language teachers

Try to answer two questions:

1. How do students learn disciplinary content in a second language?

2. What does it mean to become disciplinary literate in a second language?

Benefits of a second language

– **Many benefits of learning a second language (Airey 2003)**

– **But we know there are also a number of issues.**

– **First let's look at learning in our first language.**

Learning in our first language

Language is not passively reflecting some pre-existing conceptual structure, on the contrary, it is actively engaged in bringing such structures into being.

Halliday & Martin (1993:8)

Almost all of what we customarily call 'knowledge' is language, which means the key to understanding a subject is to understand its language.

Postman & Wiengartner (1971:103)

Learning in our first language

Learning any subject depends on learning the language in which the knowledge of that discipline is construed.

Lemke (1990)

Disciplinary learning can be viewed as a form of discourse change.

Wickman & Östman (2002)

So:

Learning in our first language

The relationship between disciplinary learning and our first language is by no means straightforward

Learning is intimately linked to language

All learning can be viewed as language learning even in a monolingual setting

From this perspective a university lecturer is a teacher of a disciplinary discourse

A goal of university teaching is the production of disciplinary literate graduates

Learning in a second language

Canadian bilingual immersion studies

– Pupils with English L1 taught in French

– Large number of studies since late 50's

– Compulsory school level

– Conclusion no noticeable effect on subject learning

E.g. Genesee (1987), Swain & Lapkin (1982)

Learning in a second language

European and Swedish studies

– In Europe we talk about CLIL Content and language integrated learning

– In Sweden this has been termed SPRINT Språk- och innehållsintegrerad inlärning och undervisning

– Most studies claim similar results to Canadian studies i.e. language is learnt with no negative effects on subject learning.

Learning in a second language

All these studies have several features in common

–Focused exclusively on language learning

–Pay little attention to subject knowledge

–Deal with lower levels of schooling

Learning in a second language

Met & Lorentz (1997), and Duff (1997) have suggested that limitations in L2 may inhibit students' ability to explore abstract concepts in non-language subjects

This appears to have been confirmed by

Marsh, Hau and Kong (2000, 2002).

The study

- Parallel courses in English and Swedish

- Videoed two lectures – one in each language

- In total 22 students at two universities

- Each student interviewed individually ~ 1.5 hrs

- Selected video clips used to stimulate recall

- Asked students to describe and explain physics concepts in Swedish and English

Results

- Gave two types of results:

  - Student ability to describe and explain in English and Swedish the concepts they meet in their lectures as a function of lecture language (English, Swedish, or both)

  - Student learning patterns

Student descriptions

Students speak on average 45% slower in their English descriptions

But:

For most students, the quality of their descriptions in both languages is similar and independent of the teaching language

Note: NOT the same as saying the
             teaching language doesn't matter

Code-switching

Some students do have serious problems describing disciplinary concepts in English

All three are first year students

Never been taught in English before

These three students had little problem describing their background in English

Adapt or drop out?

Code-switching

Example:

"I didn't understand why it wasn't a real … er, vad ska jag säga?... tal … er, only when you har det upphöjd till två. But she said it was an imeg, imag—ett sånt där tal"

This student has no spontaneous access to the disciplinary terms number, squared and imaginary

Student learning patterns

– Students report no difference in their learning when taught in Swedish or English

– However, during stimulated recall students did report a number of important differences

Student learning patterns

When taught in English

– Students ask and answer fewer questions

– Important finding

– Narrower shared space of learning Tsui (2004)

Student learning patterns

When taught in English

– Students who take notes have difficulty following the lecture

– The success of these students appears to depend on doing extra work outside class

Student learning patterns

Students adapted their study habits…

– Only asked questions after the lecture

– Stopped taking notes in class

– Read sections of work before class

– Simply used the lecture for mechanical note-taking

Airey and Linder (2006; 2007)

Seven recommendations

The following are seven recommendations for lecturers based on my results and my own experience:

1. Discuss the fact that there are differences when lectures are in a second language.

2. Create more opportunities for students to ask and answer questions in lectures.

3. Allow time after the lecture for students to ask questions.

Seven recommendations

4. Ask students to read material before the lecture.

5. Give out lecture notes in advance or follow the book

6. Exercise caution when introducing new material in lectures

7. Give as much multi-representational support as possible.

One more recommendation

8. Don't use lectures!

Use seminars, group work etc. instead or record the lecture and adopt a flipped classroom approach

Finally…

Until lecturers see their role as one of socialising students into the discourse of their discipline, there can be no discussion of disciplinary literacy goals. Without such a discussion lecturers will continue to insist that they are not language teachers and that this should be a job for someone else.

(Airey 2011a; 2012)

Overview

Try to answer two questions:

1. How do students learn disciplinary content in a second language?

2. What does it mean to become disciplinary literate in a second language?

Widening the scope

- – Found that language alone was insufficient to describe the interview data I collected.

- – Other representations or semiotic resources seemed important.

- – First I had three languages..

- – Mathematics, diagrams, graphs, lab work etc.

- – A multimodal approach

Critical Constellations of Resources
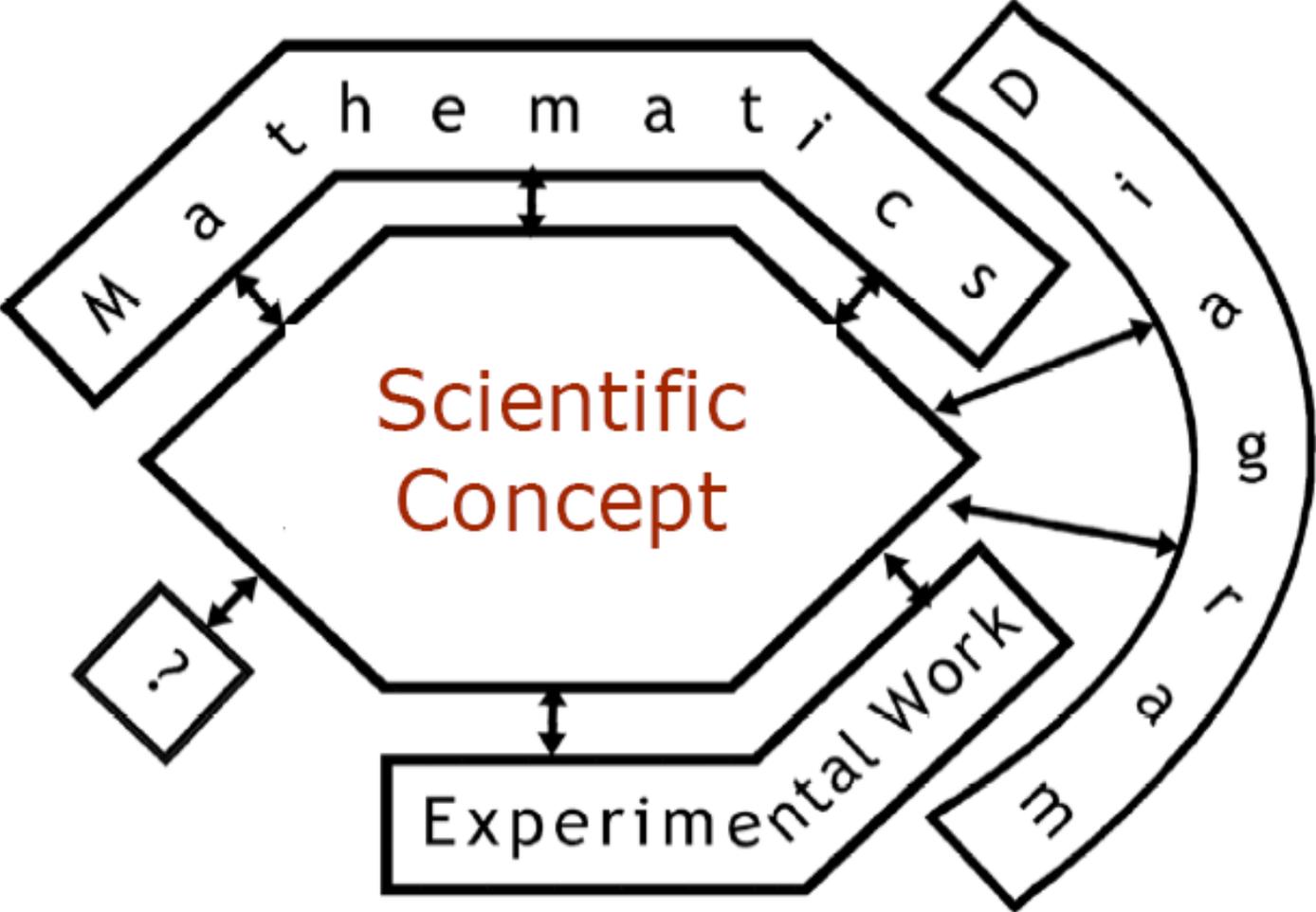
Critical Constellations of Resources

Differs from discipline to discipline.

Draw on the work of Bernstein

Best known for his work on codes

Restricted code

Elaborated code

Universally condemned!

More interested in his work on knowledge structures

Disciplinary knowledge structures

Bernstein (1999) classified disciplinary knowledge structures as hierarchical or horizontal

Hierarchical knowledge structures

Progress by integration of new knowledge with existing knowledge

Horizontal knowledge structures

Progress by introducing new perspectives that do not need to be coherent with existing perspectives

Hierarchical knowledge structures

Knowledge grows by explaining more and more phenomena within the same system.

Hierarchical knowledge structures

Science knowledge is hierarchical

A new theory cannot just explain a new phenomenon, it must also explain everything the old theory explained.
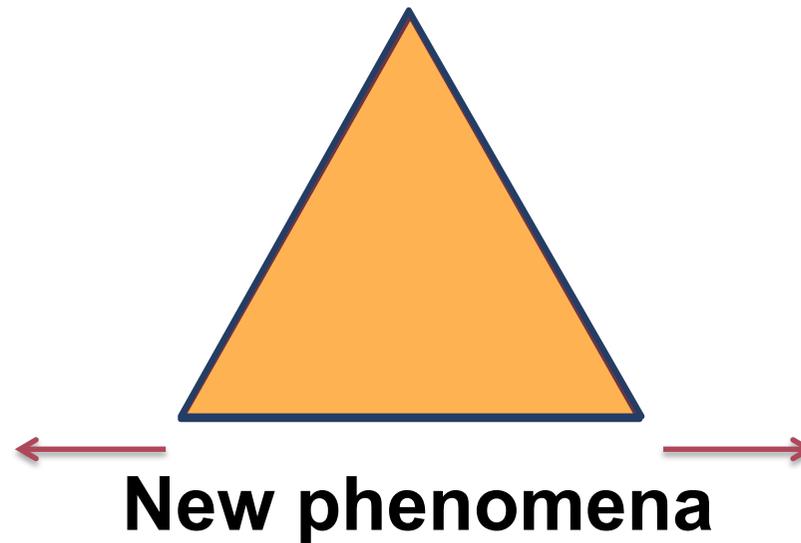
Martin (2011) likens this kind of knowledge production to a growing triangle

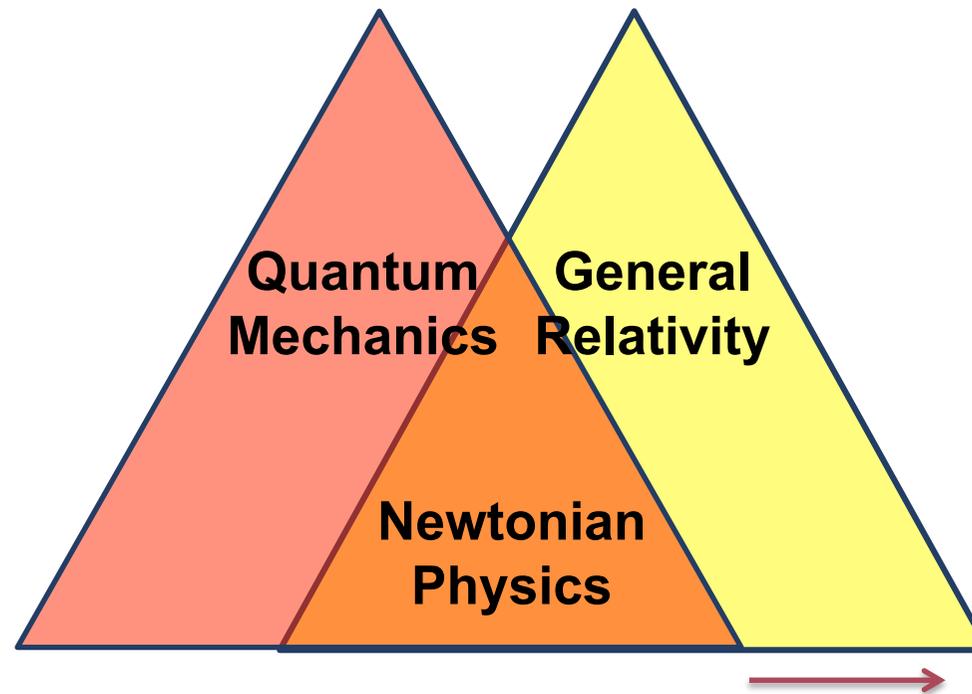Widen the base to include more phenomena in the same explanatory structure.

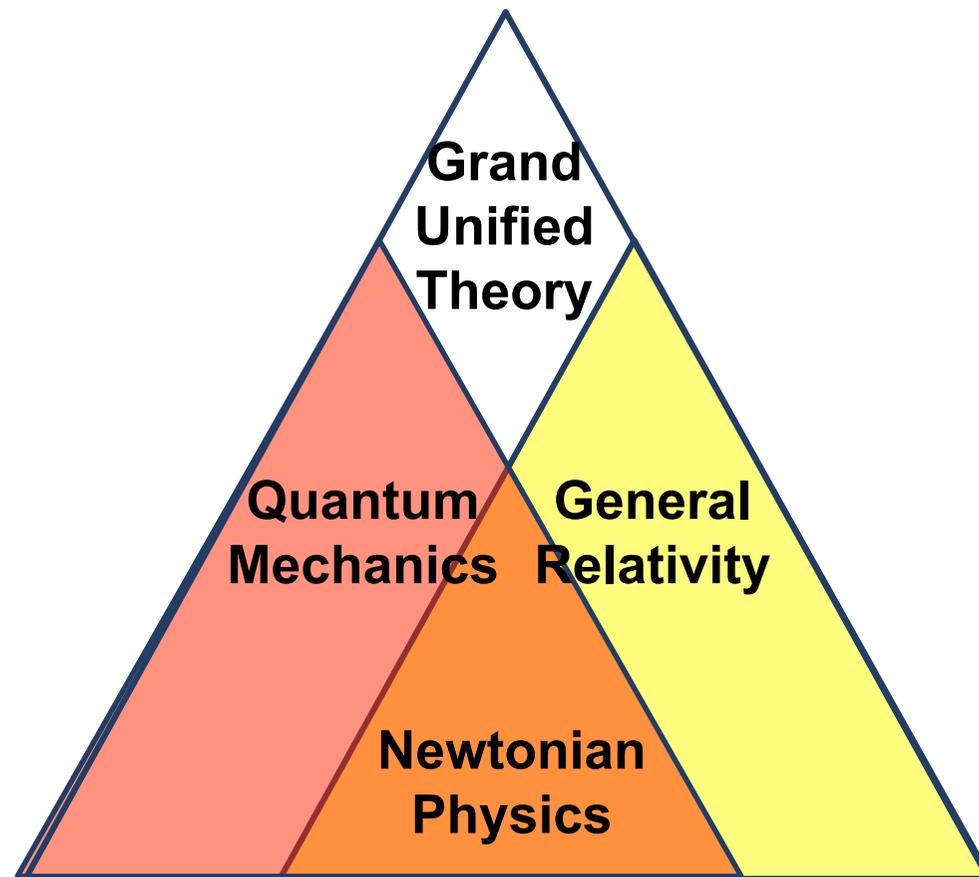# Hierarchical knowledge structures

Hierarchical knowledge structures

So what are horizontal knowledge structures ?

Horizontal knowledge structures

Knowledge grows by finding new ways to interpret the world.

Not necessary for one interpretation to be coherent with another.

The new perspective is what is important.

Knowledge is context dependent and disputed.

Horizontal knowledge structures

Humanities and social sciences are more horizontal.

Bernstein likens knowledge production to the introduction of new explanatory languages.

$L_1 + L_2 + L_3 + L_4...$

Expansion of knowledge

Horizontal knowledge structures

These "languages" do not need to be compatible with one another.

Each offers a different perspective that may or may not be useful in a given situation

Same phenomenon can be analysed in different ways:
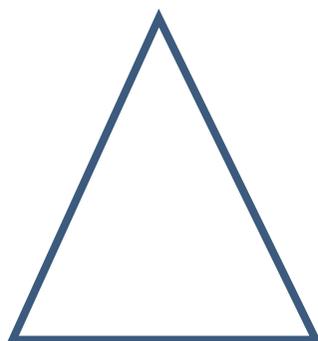
Post-colonnial

Feminist

Marxist

etc. etc.

Disciplinary knowledge structures

Stockholms universitet

More hierarchical
knowledge structures

"warring
triangles"

More
horizontal
knowledge
structures

physics   biology

L^1 L^2 L^3 L^4 L^5...

linguistics   sociology

history   literary studies

sciences

social sciences

humanities

Adapted from Martin (2011) and Wignell (2004)

Disciplinary literacy

What constitutes disciplinary literacy will differ from discipline to discipline and also from case to case.

Disciplinary literacy

I suggest the goal of any degree programme is the development of disciplinary literacy.

Airey (2011b)

For this to make sense I will need to define what I mean by disciplinary literacy.

What is disciplinary literacy?

Disciplinary literacy refers to the ability to appropriately participate in the communicative practices of a discipline.

What is Literacy?

Difficult word to translate to Swedish.

This is because it has two distinct meanings.

Fundamental sense:
  Ability to read and write.

Derived sense:
  metaphor—suggests familiarity or competence.

  This is what is usually meant when literacy is used together with a discipline.

What is Literacy?

- Gee (1991) suggests that we have one primary discourse (the oral language we learn as a child) and many secondary discourses (specialised communicative practices used in other sites outside the home).

- Gee defines Literacy as 'fluency in' these secondary discourses.

- So literacy depends on the site
  i.e. Where will it used
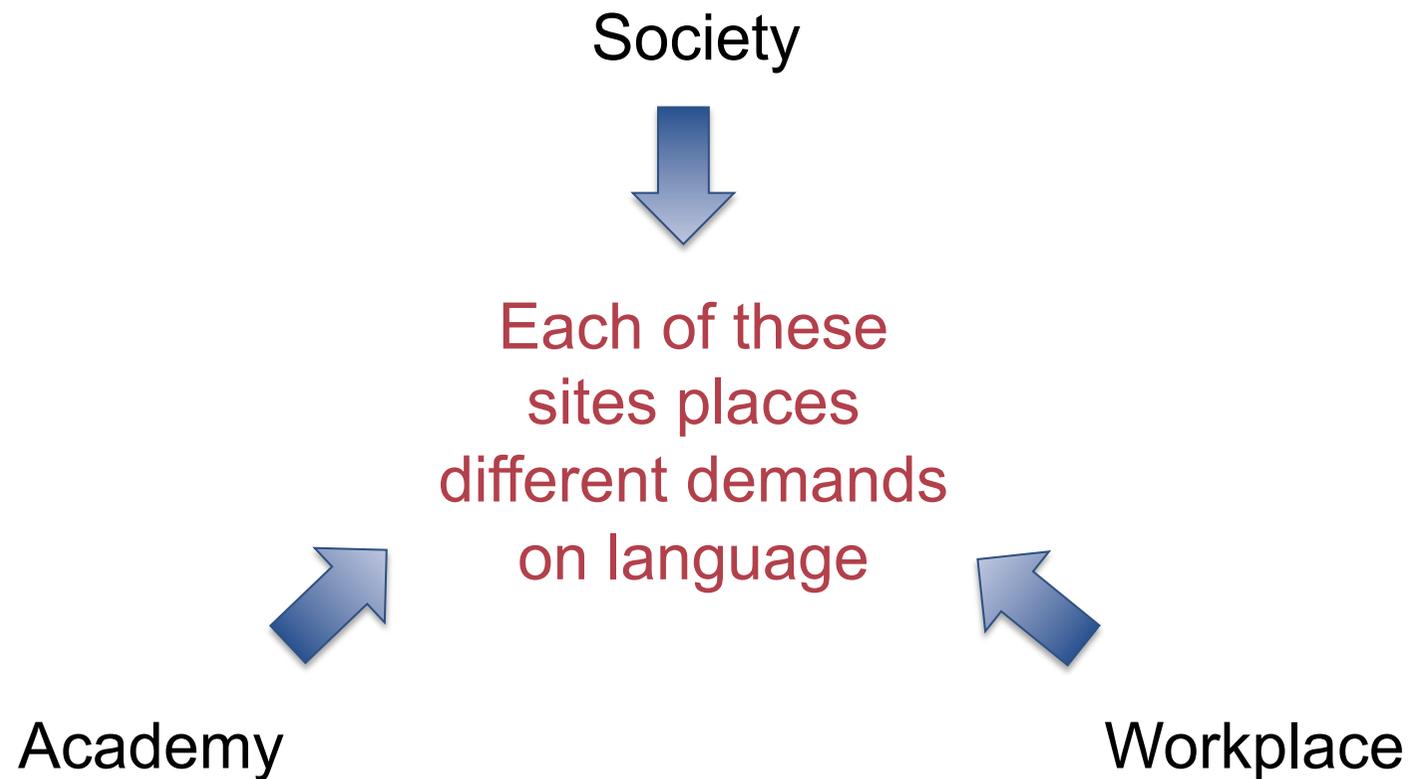
Disciplinary literacy

– So what site does disciplinary literacy refer to?
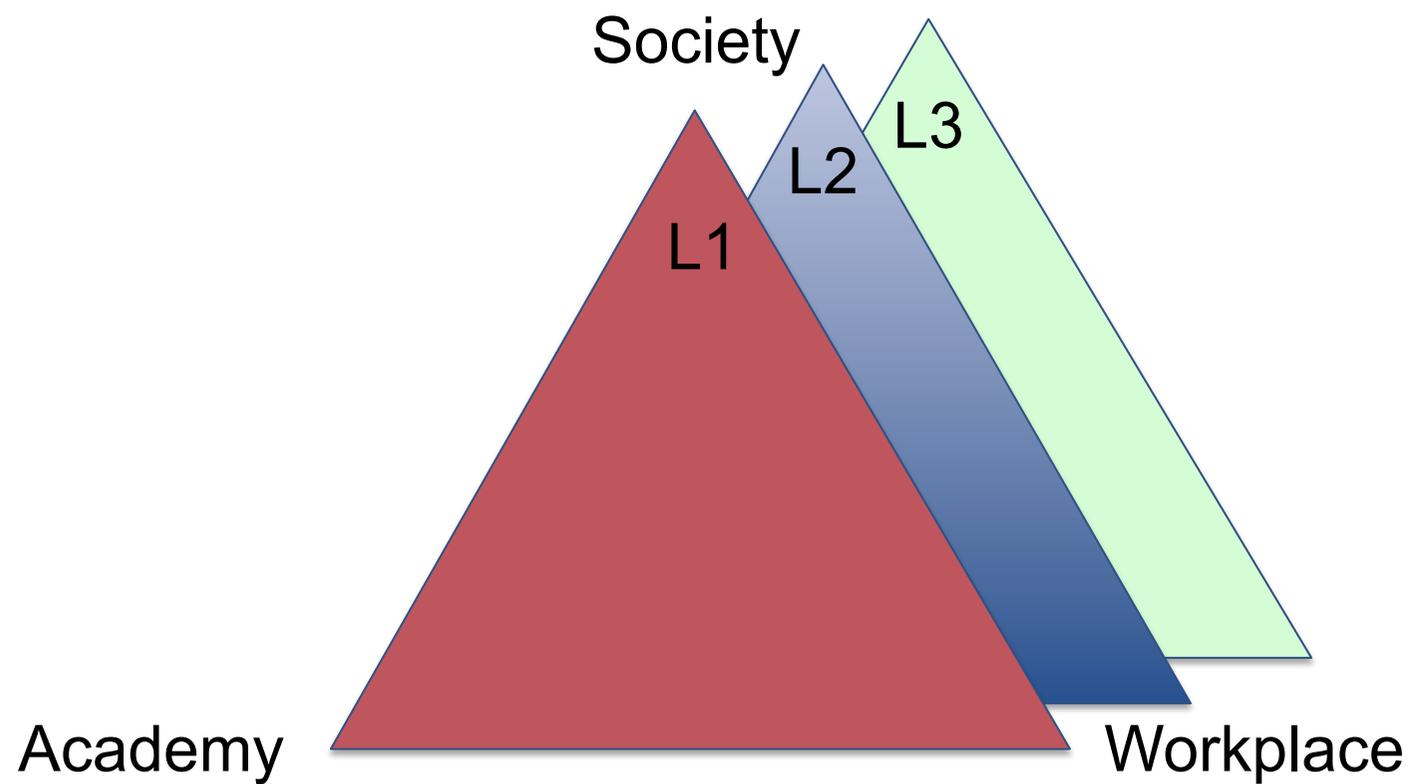
Disciplinary literacy

I suggest that the disciplinary literacy goals of any degree course will entail a unique mix of fluency in three specific sites:

- The academy
- The workplace
- Society

Disciplinary Literacy Triangle

Society

Academy

Workplace

Each of these
sites places
different demands
on language

Parallel language use

In the Nordic countries the concept of parallel language use is widespread.

Two or more languages used alongside each other at universities.

Does parallel mean doing everything in all languages?

What do we want students to be able to do in each language?

Disciplinary Literacy Discussion Matrix

Bring together my discussion of disciplinary literacy in a simple heuristic tool—the Disciplinary Literacy Matrix.

The three columns of the matrix correspond to the three sites in which disciplinary literacy may be enacted.

The rows of the matrix relate to languages and other modes that students may need to become fluent in.

Disciplinary Literacy Discussion Matrix

Where used?

		Academy	Workplace	Society
First language	Reading			
	Writing			
	Listening			
	Speaking			
Swedish	Reading			
	Writing			
	Listening			
	Speaking			
Other modes (please add to the list)	Graphs			
	Tables			
	Diagrams			
	Mathematics			
→				
→				
→				
→				

Adapted from Airey (2011a)

Using the Matrix

Discuss with a colleague.

What are your disciplinary literacy goals for your students?

Go though the matrix describing what you think your students need.

Swap and let your colleague do the same

Summary

Literacy is a metaphor
Fundamental and Derived senses.

Literacy is multimodal

I define disciplinary literacy as:

The ability to appropriately participate in the communicative practices of a discipline.

Summary

Each discipline fosters a unique form of disciplinary literacy for three sites: Society, Academy and Workplace.

The demands placed on language and other modes of communication in these three sites are very different.

Summary

Each of these sites has the potential to be divided into a local and an international form.

The international forms will almost certainly involve English, whilst the local forms will probably involve one or more other languages.

The Disciplinary Literacy Discussion Matrix may be a useful tool for discussing literacy goals.

Questions or Comments?

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