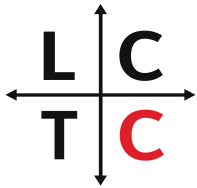# LCT Centre for Knowledge-Building
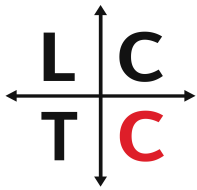
Making Waves Together
How LCT can help crack the codes of education

Karl Maton
University of Sydney

Plan

1. Problem of segmentalism

   – and ironic problem addressing that problem

2. Semantics dimension of LCT

3. Semantic waves in teaching

4. Teaching semantic waves

   – in academic literacy programmes

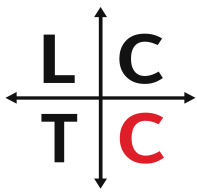   – promoting social justice

A practical problem

- Segmentalism
  - *research*: new knowledge fails to extend and integrate existing knowledge
  - *teaching & learning*: student learn segmented ideas or skills

- At heart of education
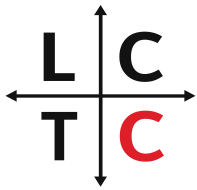 - policy focus: 'lifelong learning' to work in 'knowledge economies'
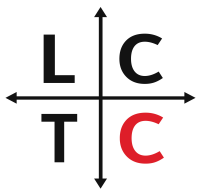
Typologies of knowledge

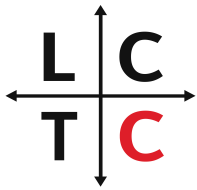|		
Bernstein	vertical discourse	horizontal discourse
Bourdieu	theoretical logic	practical logic
Foucault	programmes	technologies
Freud	ego	id
Levi-Strauss	science	bricolage
Levy-Bruhl	modern thinking	primitive thinking
Luria	abstract thinking	situational thinking
Piaget	science/effective thought	technique/sensori-motor
Sohn-Rethel	intellectual	manual
Vygotsky	conceptual thinking	complex thinking
Walkerdine	formal reasoning	practical reasoning

Typologies of knowledge

- Biglan (1973): hard/soft, pure/applied, life/non-life

- Kolb (1981): abstract/concrete, active/reflective

- e.g. Becher (1994): mix of above for research 'tribes'

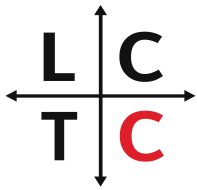- And Bloom (1976), Shulman (1986), diSessa (1993), Bereiter (2002), etc, etc.

Missing the point

- Debate focuses on whether typologies include all kinds of knowledge

- *Advocates*: admit 'cannot do justice to the complexity and variation of…knowledge structures in various disciplines' (Kolb 1981)

- *Critics*: argue need for additional or different categories

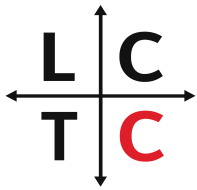- *Both*: try to draw map as big as the country

Segmental thinking

- types only describe surface features of knowledge

- lack analysis of organizing principles

- empirical practices do not fit types

- obscure processes of change within or between forms

- represent a first step – need to build on

Need concepts:

- for analysing organizing principles underlying practices
  - systematically show difference, variation, similarity
  - explore change over time

- that can be enacted in wide range of contexts
  - what is generic and specific
  - not segmented models

Legitimation Code Theory (LCT)

- conceptual toolkit
- created from and for empirical research and practice
- widely used in education, sociology, and linguistics
- growing rapidly
  - International LCT Conferences in Cape Town (2015) and Sydney (2017)
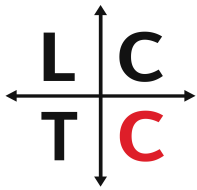 - LCT Centre for Knowledge-Building, University of Sydney
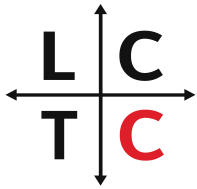
LCT in action

- pre-school, schools, colleges, universities
- research, curriculum, pedagogy, assessment
- natural sciences, social sciences, humanities
- applied subjects – e.g. music, ballet
- professional/vocational – engineering, design, journalism, etc.
- academic literacy
- educational technology
- 'critical thinking'
- climate change debate
- informal learning: museums, art exhibitions, Freemasonry
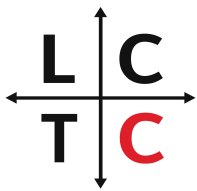- law
- culture of armed forces

… and many others, available at:
http://www.legitimationcodetheory.com
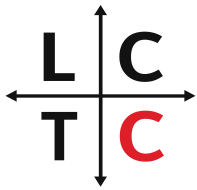
Sociological approach

- society comprises series of relatively autonomous social fields of practice

- actors cooperate and struggle for status and resources

- actors' practices are *languages of legitimation*

- organizing principles of those practices are *legitimation codes*

- balance of power among legitimation codes (defined by *devices*) shape what is/not possible

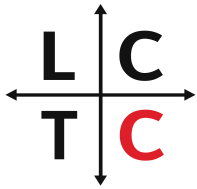| Dimension	Referents	Legitimation codes
Semantics	meaning	semantic gravity, semantic density
Specialization	symbolic/ social	epistemic relations, social relations
Autonomy	external relations	positional autonomy, relational autonomy
Temporality	time	temporal position, temporal orientation
Density	internal relations	material density, moral density
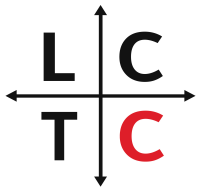
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Temporality	time	temporal position, temporal orientation
Density	internal relations	material density, moral density

Semantic gravity

- degree to which meaning relates to its context (whether social or symbolic)

- may be stronger (+) or weaker (−) along a continuum of strengths
  - weaker = less context-dependent
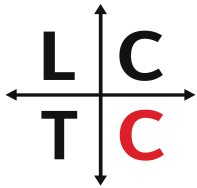 - stronger = more context-dependent

weaker SG

stronger SG

Semantic gravity

- *weakening* semantic gravity
  - e.g. moving from the minute particulars of a specific context or case to generalities

- *strengthening* semantic gravity
  - e.g. moving down from an abstracted concept to delimited examples

Semantic density

- degree of complexity of meaning

- may be stronger (+) or weaker (–) along a continuum of strengths
  - stronger = more meanings condensed
  - weaker = fewer meanings condensed

- strength related to *semantic structure* (constellations of meaning)
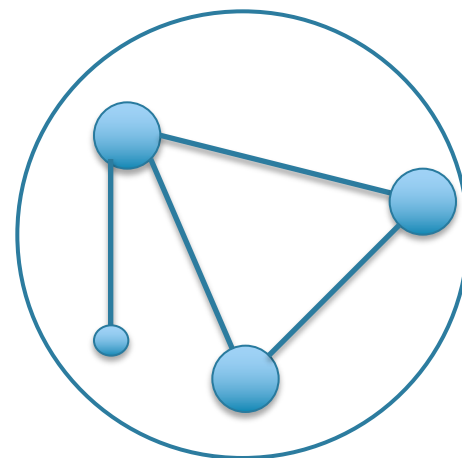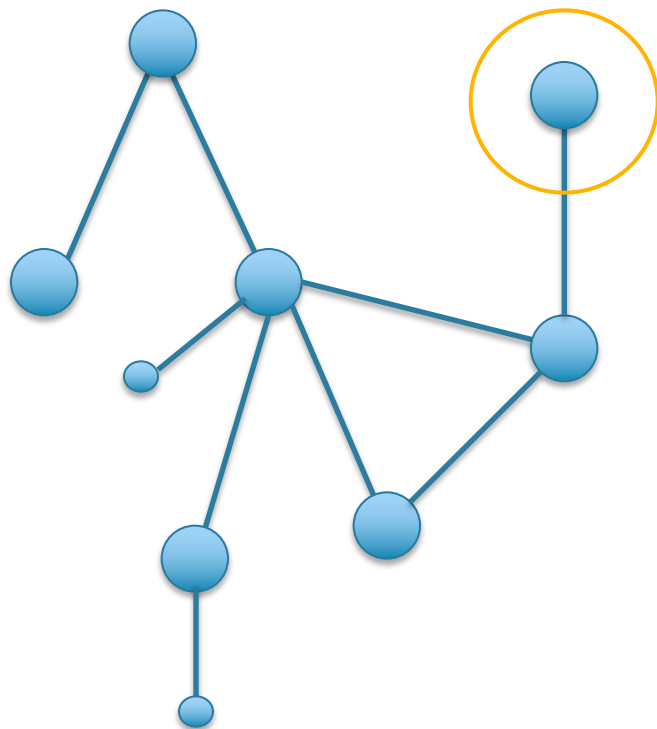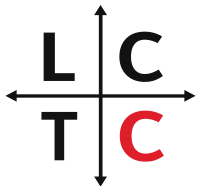
stronger SD

weaker SD
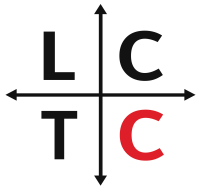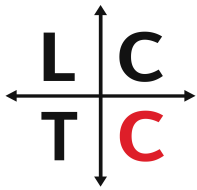
Semantic density: relationality

- imagine single unit
  - 'Gwiffly'

- add relations
  - 'There are two kinds of Gwiffly: A-Gwiffly and B-Gwiffly'

- this strengthens semantic density through relations with two subtypes

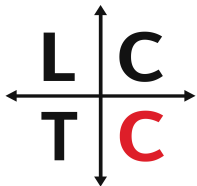- more relations = stronger semantic density
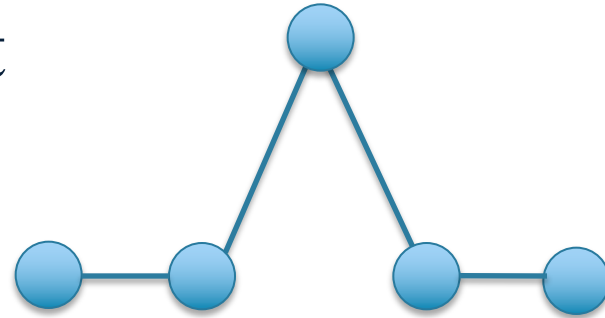
Constellation

Gold

- everyday usage:
  - bright yellow, shiny, malleable metal used in coins, jewellery, dentistry and electronics

Gold

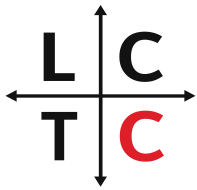- Atomic Number: 79
- Symbol: Au
- Atomic Weight: 196.9665
- Electron Configuration:[Xe]$6s^14f^{14}5d^{10}$
- Isotopes: 18.
- Density (g/cc): 19.3
- Melting Point (° K): 1337.58
- Boiling Point (° K): 3080
- Atomic Radius (pm): 146
- Atomic Volume (cc/mol): 10.2
- Covalent Radius (pm): 134
- Ionic Radius: 85 (+3e) 137 (+1e)

- Specific Heat (@20° C J/g mol): 0.129
- Fusion Heat (kJ/mol): 12.68
- Evaporation Heat (kJ/mol): ~340
- Debye Temperature (° K): 170.00
- Pauling Negativity Number: 2.54
- First Ionizing Energy (kJ/mol): 889.3
- Oxidation States: 3, 1
- Lattice Structure: Face-Centered Cubic (FCC)
- Lattice Constant (Å): 4.080
- Specific Gravity (20° C): 18.88
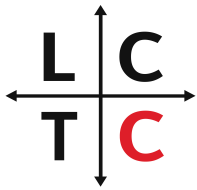
Semantic density

- *strengthening* semantic density
  - e.g. condensing a large range of meanings into a symbol or technical term

- *weakening* semantic density
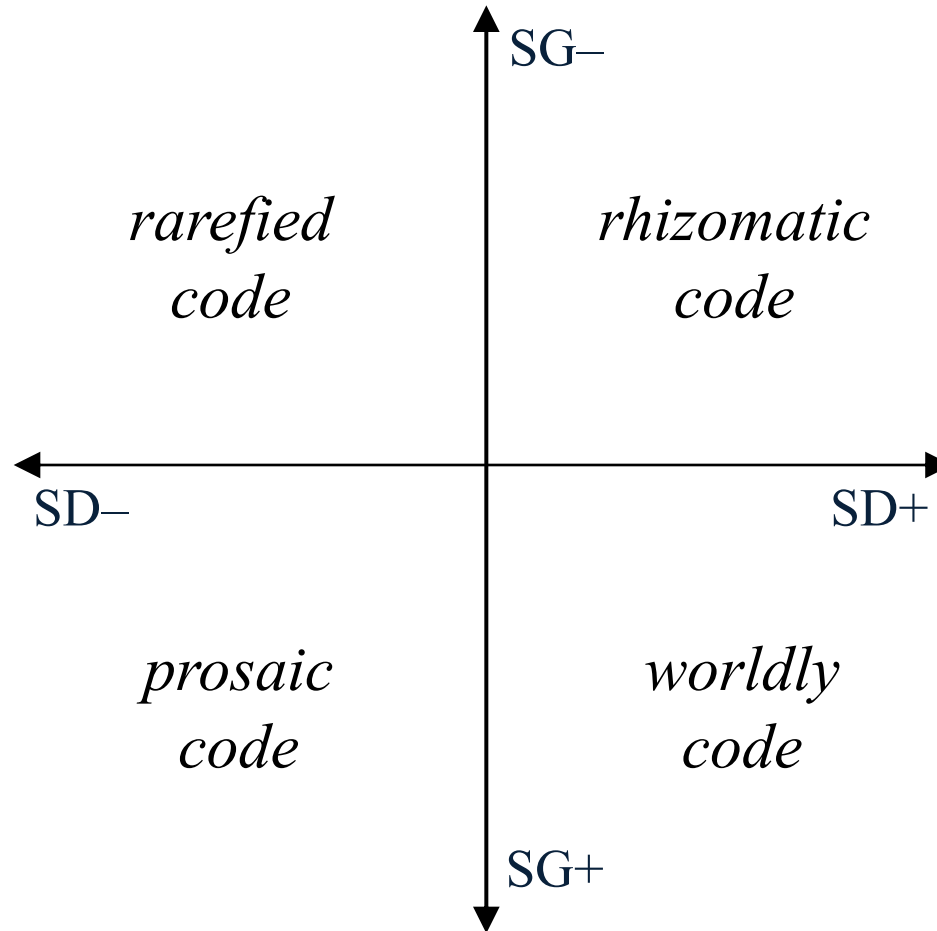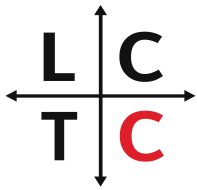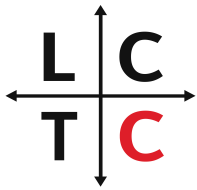 - e.g. 'unpacking' meanings of a symbol or concept
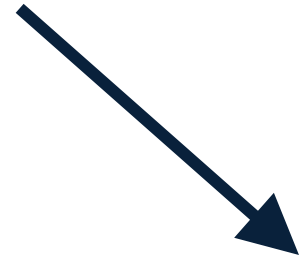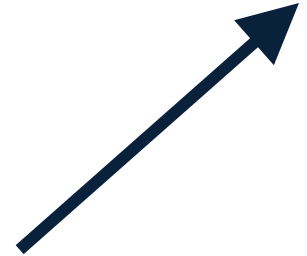
Semantics

1. Organizing principles:
   – *semantic codes*: SG+/–, SD+/–

1. Chart change over time:
   – *semantic profiles*: SG↑↓, SD↑↓

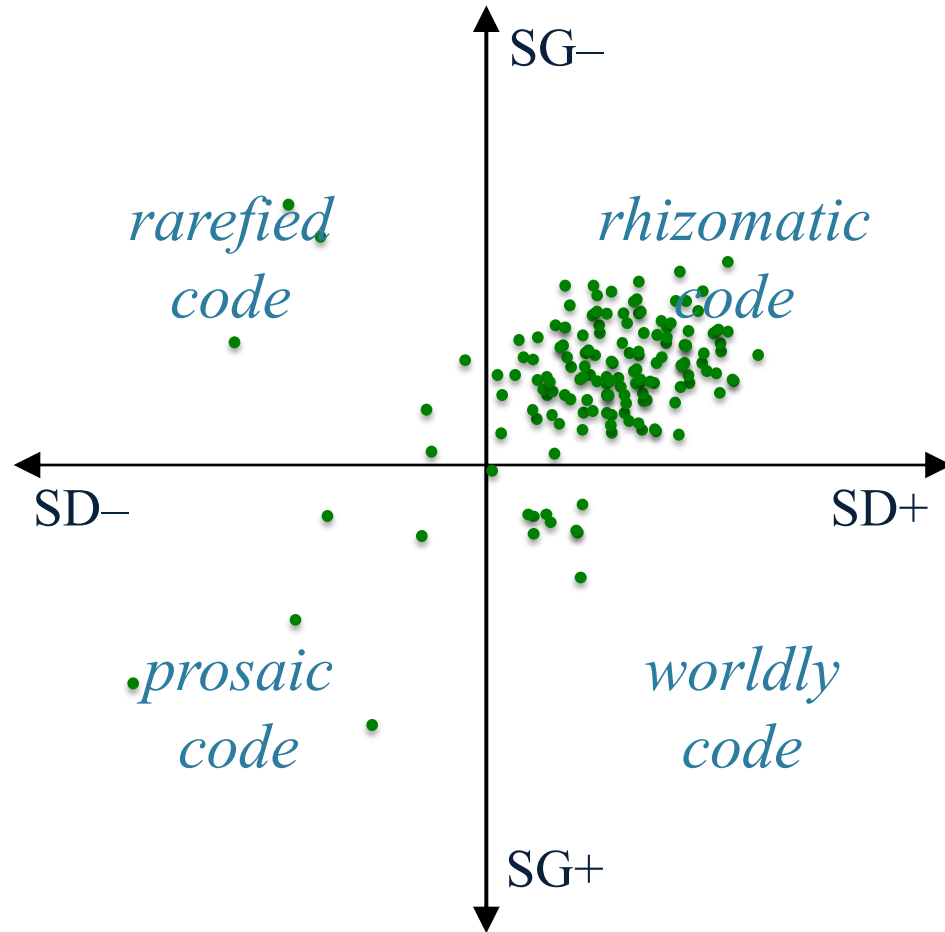# Semantic codes

SG–

rarefied code

rhizomatic code

SD–

SD+

prosaic code

worldly code

SG+

Semantic codes

SG–

rarefied code

rhizomatic code

SD–   SD+

prosaic code

worldly code

SG+

Semantic codes

SG−

rarefied code

rhizomatic code

SD−   SD+

prosaic code

worldly code

SG+

Semantic codes

rarefied code   *rhizomatic code*

SG–

SD–   SD+

prosaic code   *worldly code*

SG+

Semantic codes

Semantics

1. Organizing principles:
   – *semantic codes*: SG+/–, SD+/–

1. Chart change over time:
   – *semantic profiles*: SG↑↓, SD↑↓

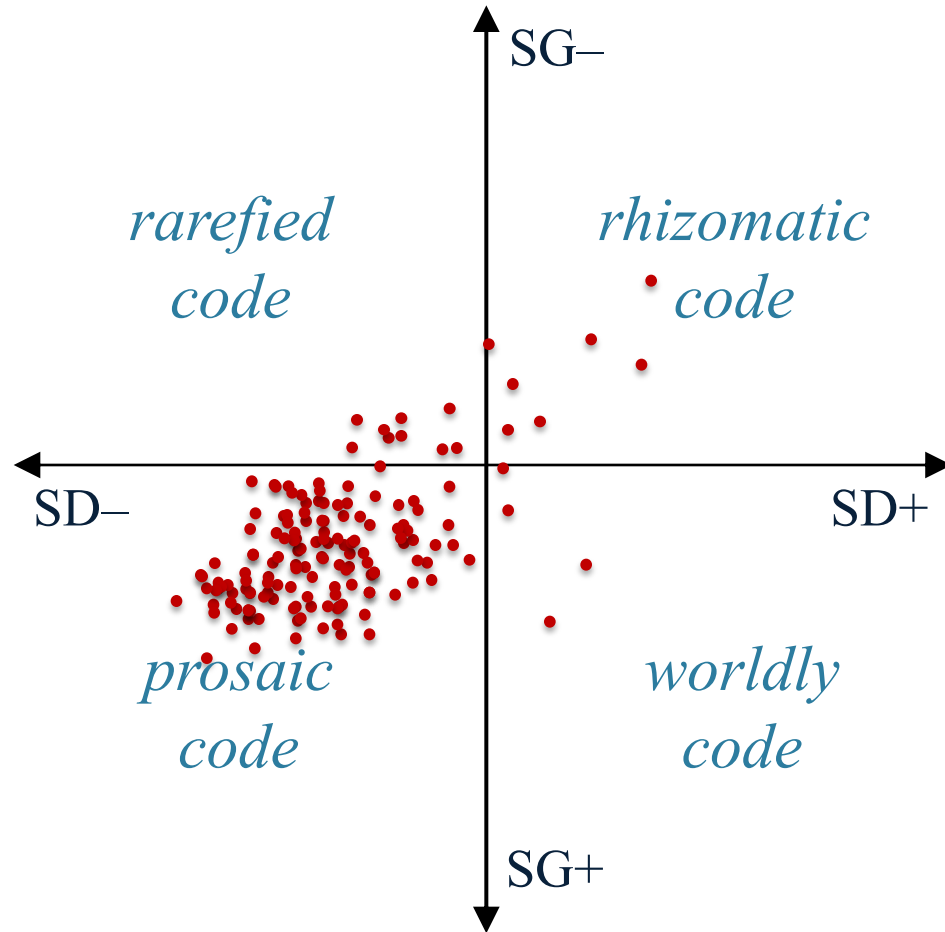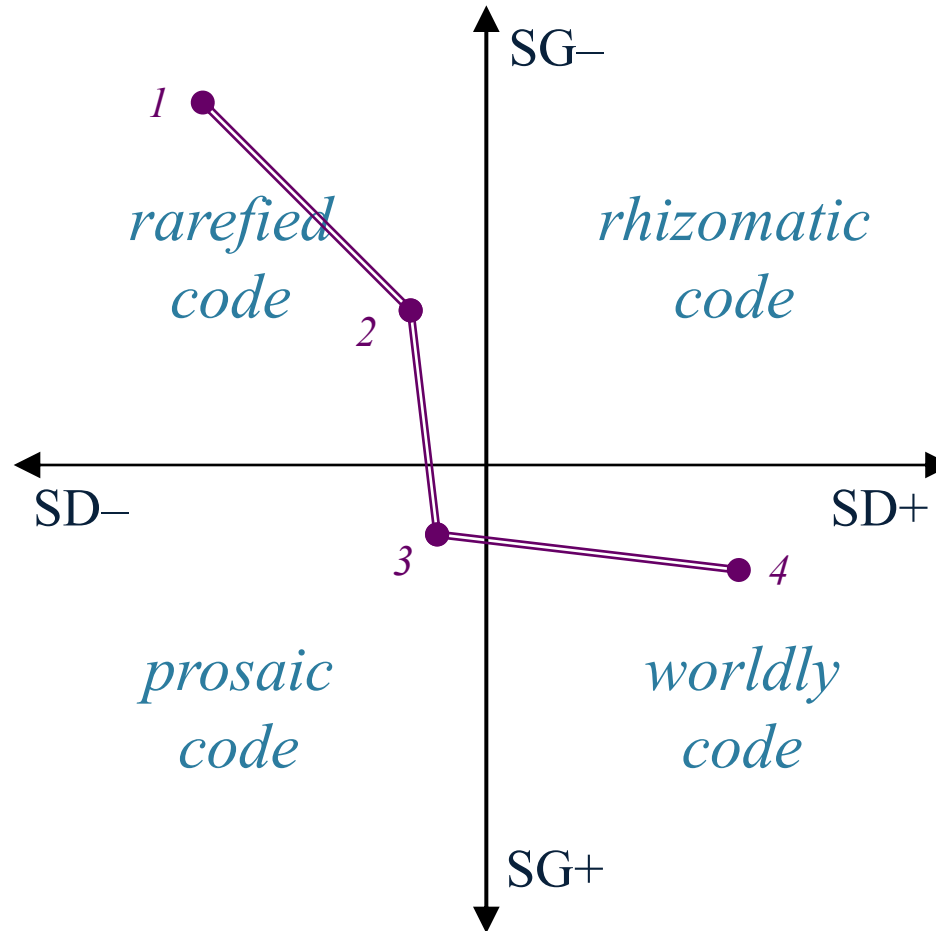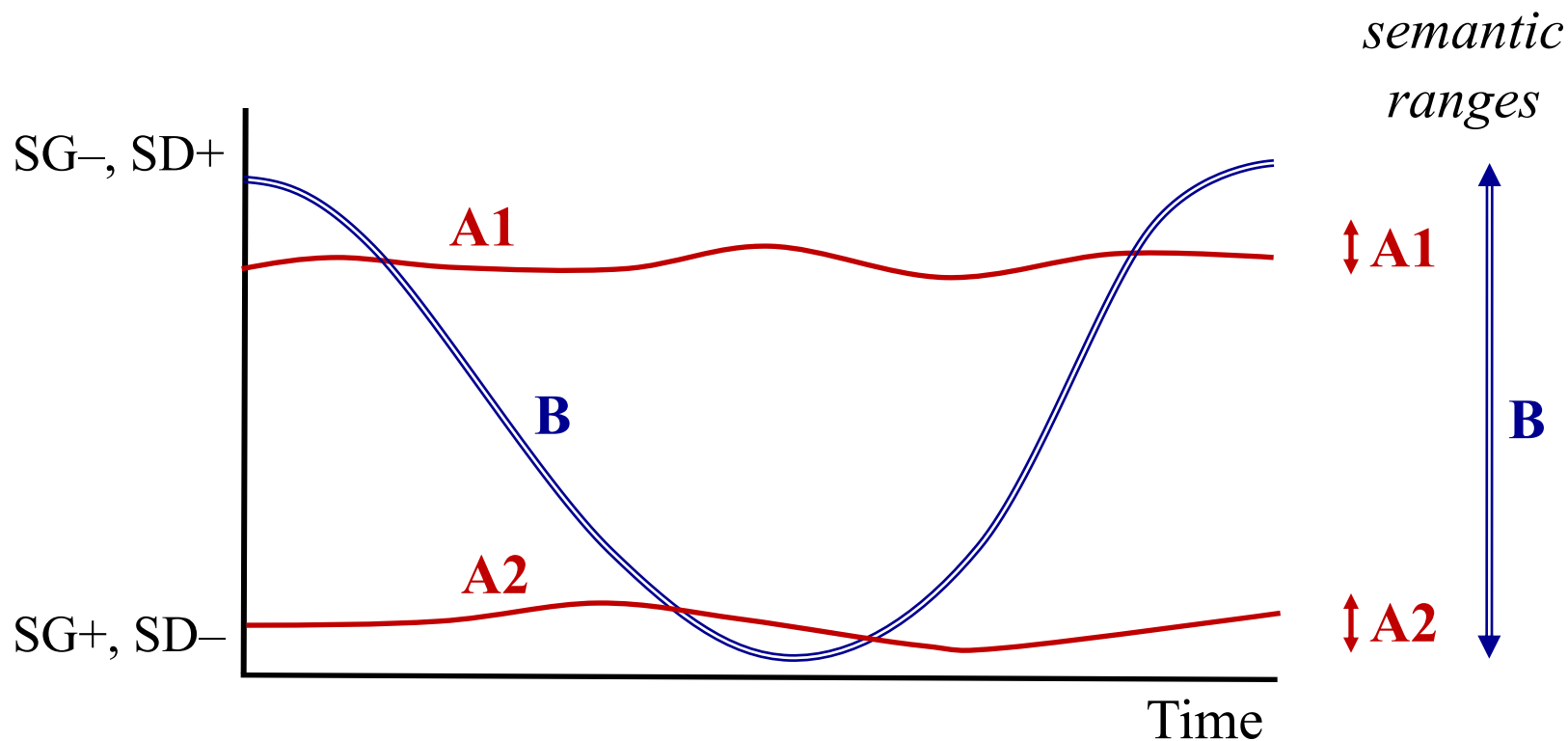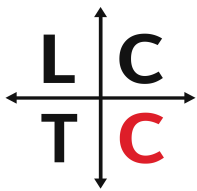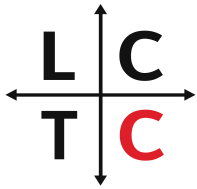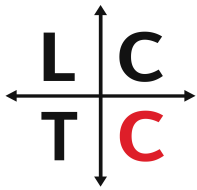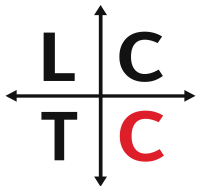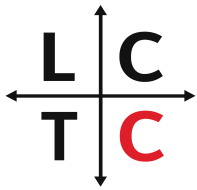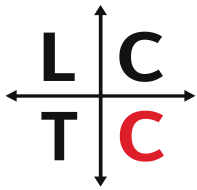# Semantic profiles and ranges

semantic ranges

SG−, SD+

A1

B

A2

SG+, SD−

Time

↕ A1

B

↕ A2

Some studies with Semantics

- in education:
  - academic literacies (Kirk 2017, Clarence 2015)
  - biology (Kelly-Laubscher & Luckett 2016)
  - business studies and social work (Szenes *et al*, 2015)
  - cultural studies (Hood 2016)
  - design (Wolmarans 2016)
  - engineering (Winberg *et al*. 2016, Wolff & Luckett 2013)
  - English (Christie 2014, Jackson 2016)
  - environmental science (Glenn 2016, Tan 2012)
  - History (Matruglio *et al*. 2013)
  - jazz (J.L. Martin 2013)
  - journalism (Kilpert & Shay 2013)
  - marketing (Arbee *et al*. 2014)
  - physics (Georgiou 2016, Doran 2017)
  - sociology (Stavrou 2012)
- beyond education
  - museums (Blunden 2016), climate change understanding (Glenn 2016), parliamentary procedures (Siebörger & Adendorff 2015), freemasonry (Poulet 2012)

Teaching

- Semantic waves in teaching
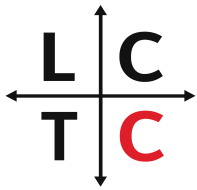 - to help build knowledge in classrooms

- Teaching semantic waves
  - academic literacy that gives students keys to the codes
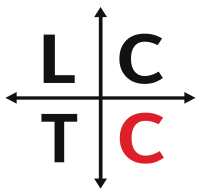
Knowledge-building in classrooms
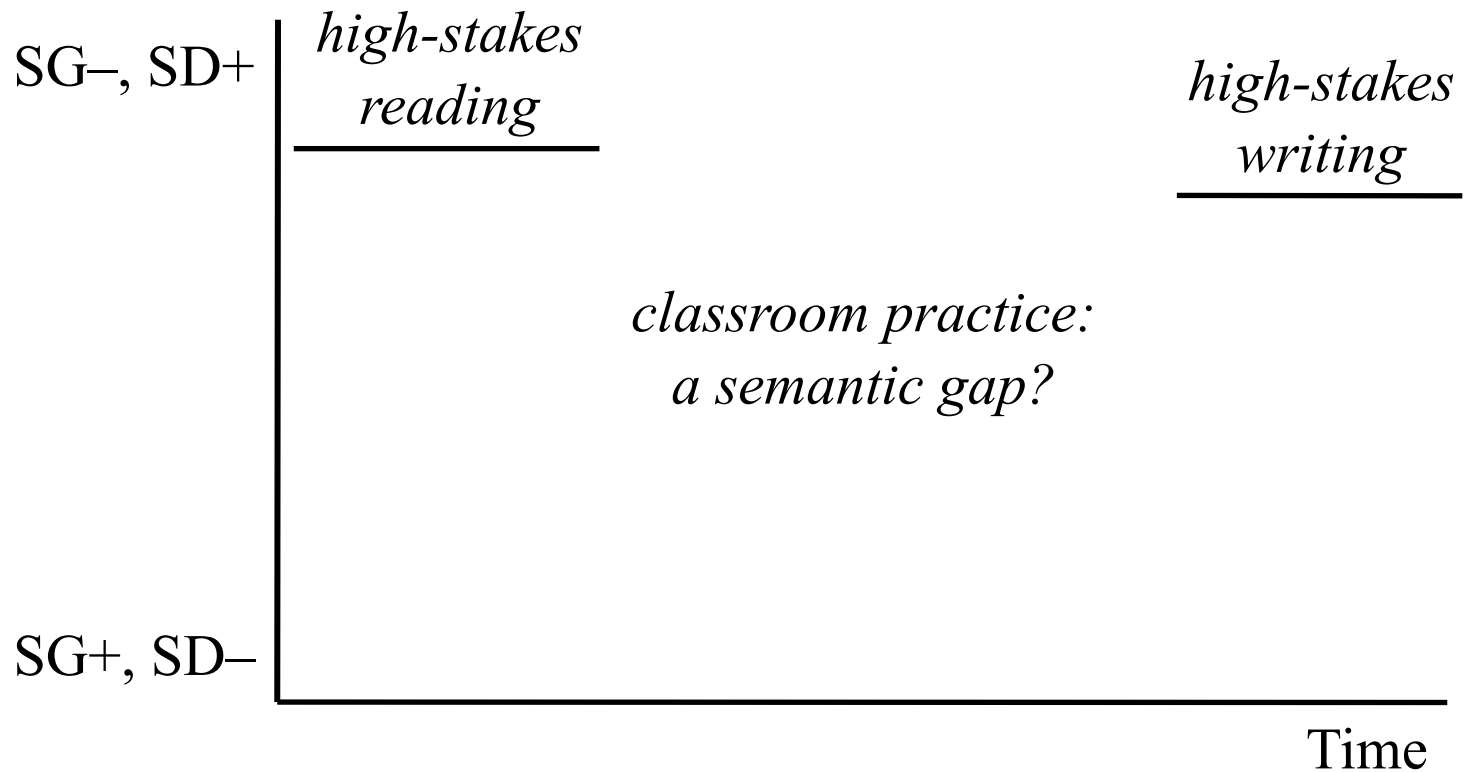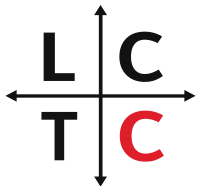
- *DISKS Project*
  - *Disciplinarity, Knowledge and Schooling*
  - 2009–12
  - J .R. Martin & Karl Maton

- *PEAK Project*
  - *Pedagogies for Knowledge-Building*
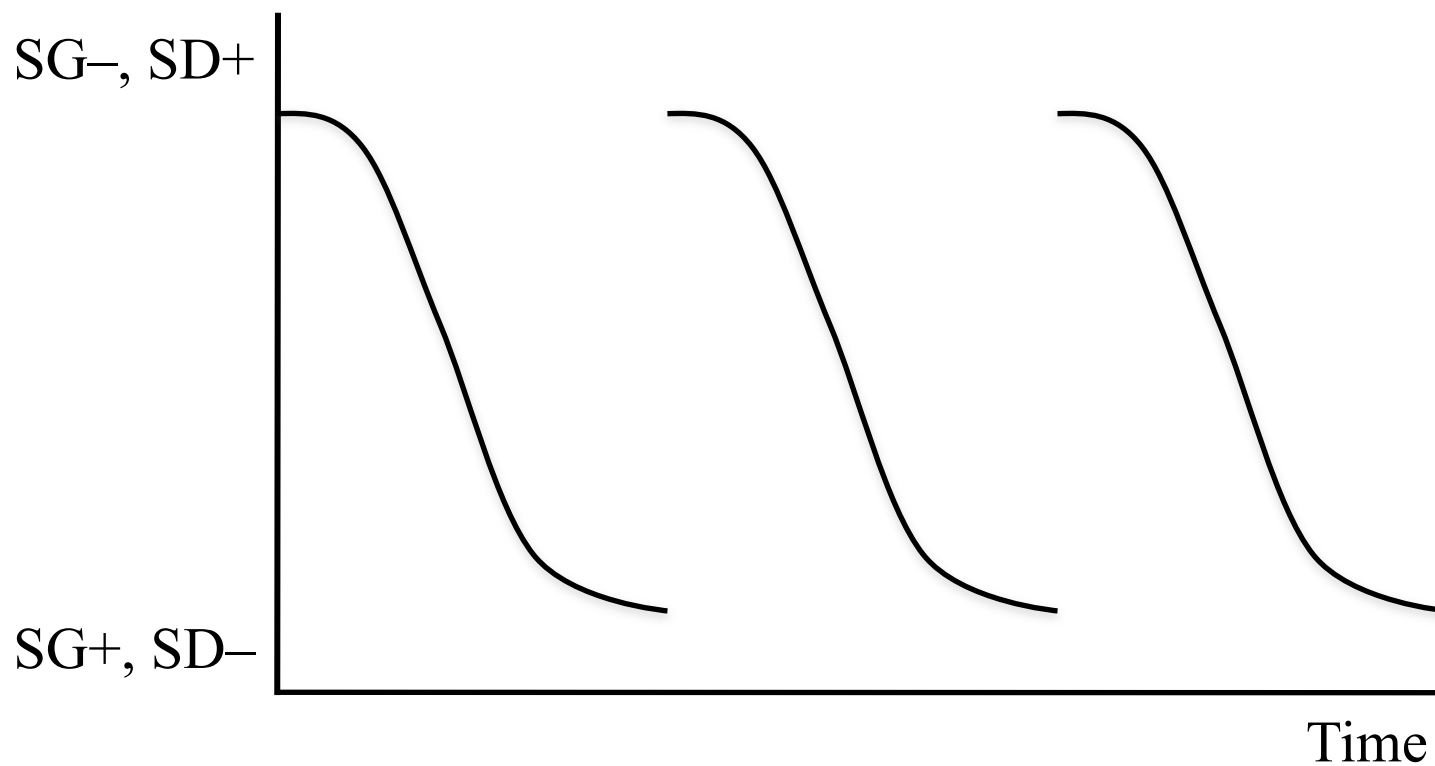 - 2013–16
  - Karl Maton, Martin, Unsworth & Howard

High stakes in classrooms
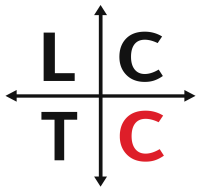
SG−, SD+

high-stakes reading

high-stakes writing

classroom practice: a semantic gap?

SG+, SD−

Time

High stakes in classrooms

This is a little bit hard, "The influence of Greek and Egyptian cultures". What does that mean? What would the influence of Greek and Egyptian cultures mean, okay? No idea, right? What it means is, if we started to look at all the things in Pompeii and Herculaneum, what objects may be showing Greek design? Or Egyptian design? Or Greek mythology? Or Egyptian mythology? Or what building techniques, like columns? Are there Greek columns? Do, you know, are the themes of their artwork reflecting it?

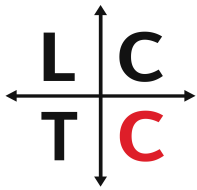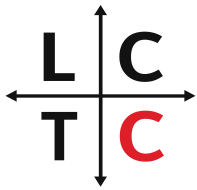This is a little bit hard, "The influence of Greek and Egyptian cultures". What does that mean? What would the influence of Greek and Egyptian cultures mean, okay? No idea, right? What it means is, if we started to look at all the things in Pompeii and Herculaneum, what objects may be showing Greek design? Or Egyptian design? Or Greek mythology? Or Egyptian mythology? Or what building techniques, like columns? Are there Greek columns? Do, you know, are the themes of their artwork reflecting it?
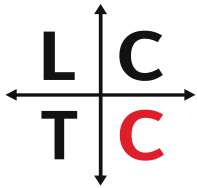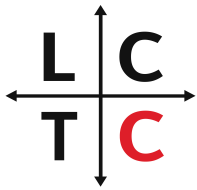
So, it's saying …remember when we started, we said that Pompeii had originally been settled by Greeks? Okay? And if we look at where Italy is, it's not that far from Egypt at this time, umm, we've, we've had, umm … Cleopatra has been killed by the time the volcano erupts, she and Mark Antony are dead and Egypt is part of the Roman Empire.

So, there would be massive amounts of trade going on, and umm, you know people visiting their diplomats you know or their, their, ambassadors… like their envoys and things like that all going back and forth across the countries. So, ideas. When you get trade in ideas - you wouldn't have heard this word before - we call it 'aesthetic trade'. Have you heard of it? Yeah

S   You told us before

So, there would be massive amounts of trade going on, and umm, you know people visiting their diplomats you know or their, their, ambassadors… like their envoys and things like that all going back and forth across the countries. So, ideas. When you get trade in ideas - you wouldn't have heard this word before - we call it 'aesthetic trade'. Have you heard of it? Yeah
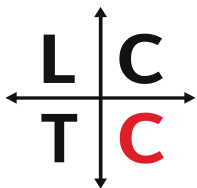
S   You told us before
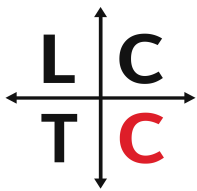
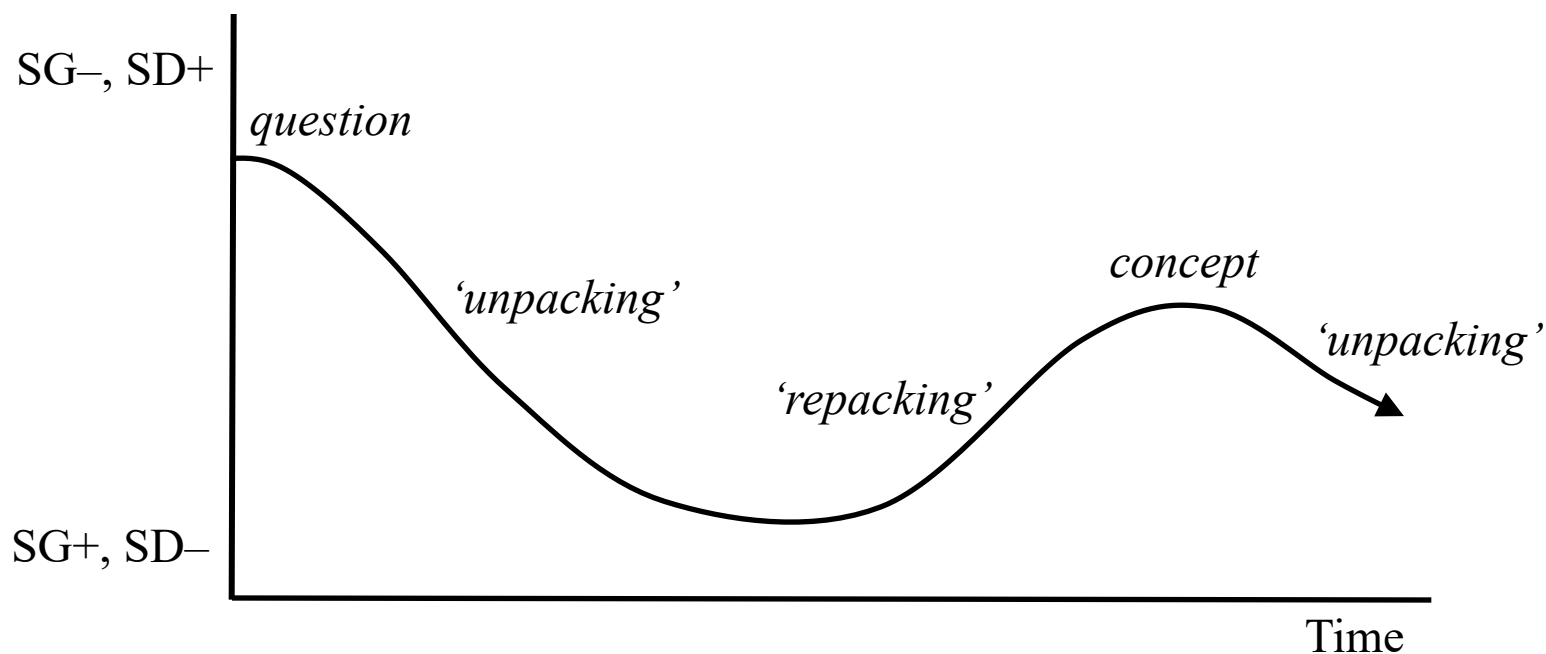T So that's what that one is. It looks hard, but all you've gotta do is have a look and think what things are there. Let me give you a big clue some of them are massive. Laah-la-lah-la- la-la-la-la-lahh, la-lah

S Theatres

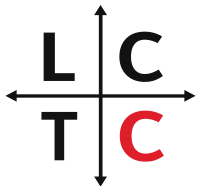T Theatres. Okay theatres are a Greek design. The Greeks invented the theatre, and then the Romans take the idea because they like it too. So, some of them are very obvious.

A semantic wave in History teaching

SG−, SD+

question

'*unpacking*'

concept

'*repacking*'

'*unpacking*'

SG+, SD−

Time

Semantic waves and high stakes

SG−, SD+

high-stakes reading

high-stakes writing

SG+, SD−

detail

Time

Science, Year 7

Lesson 1   Lesson 2   Lesson 3   Lesson 4
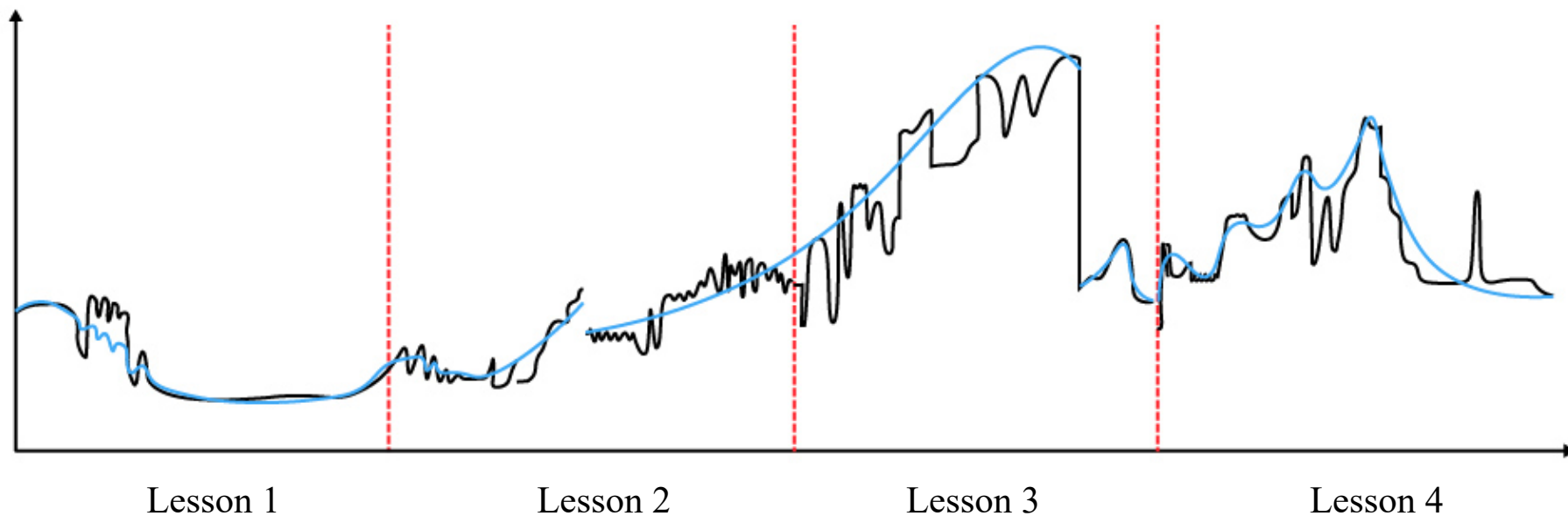
(Lauda School)

Science, Year 7

Lesson 1   Lesson 2   Lesson 3   Lesson 4
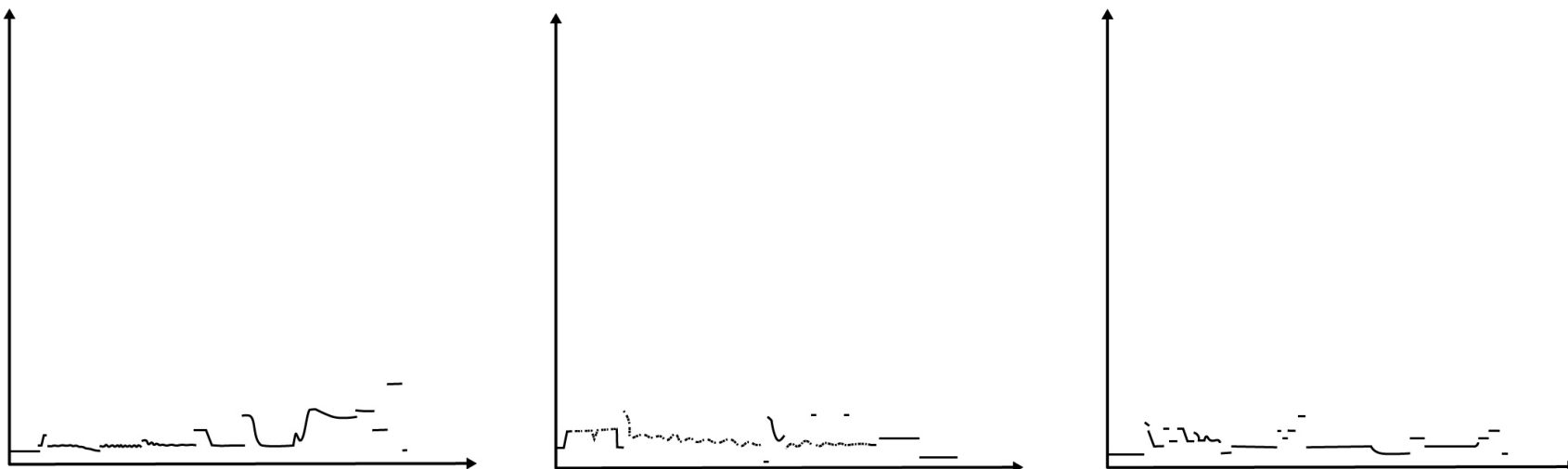
(Lauda School)

(Andretti School)
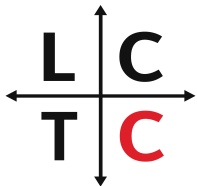
History, Year 7

(Lauda School)
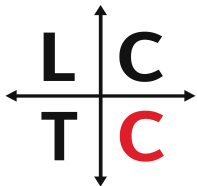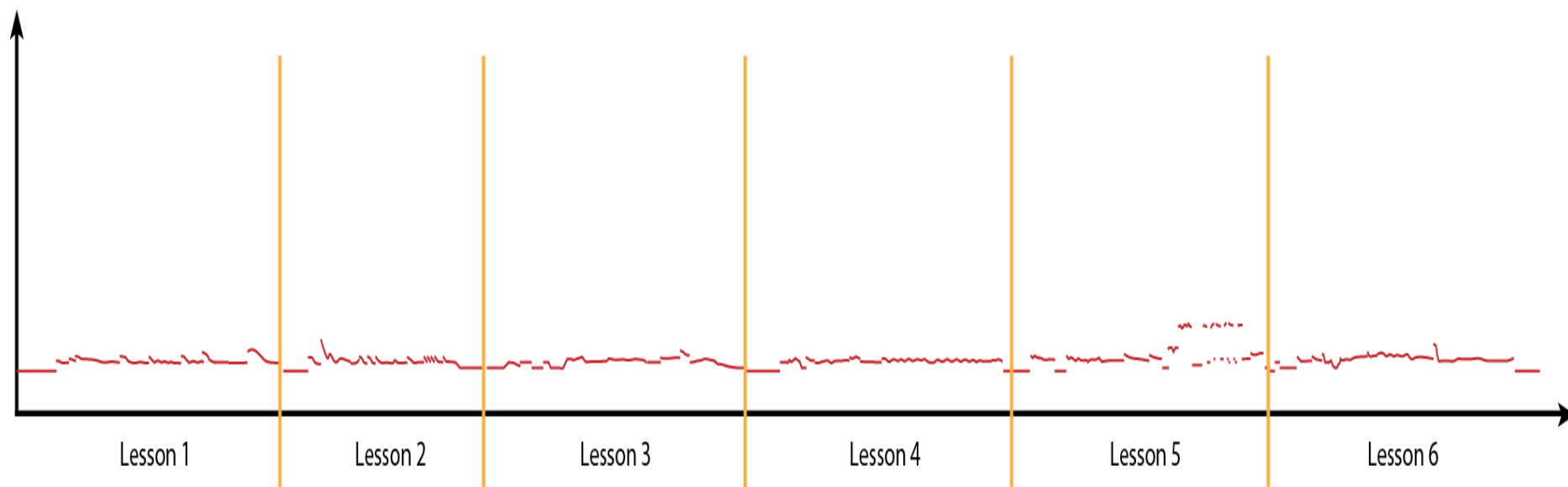
(Hunt School)
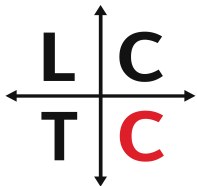
Semantic waves in research

SG–, SD+

SG+, SD–

Time

semantic ranges

Student assignments

text 1   text 2   text 3

SG–, SD+

SG+, SD–

Time
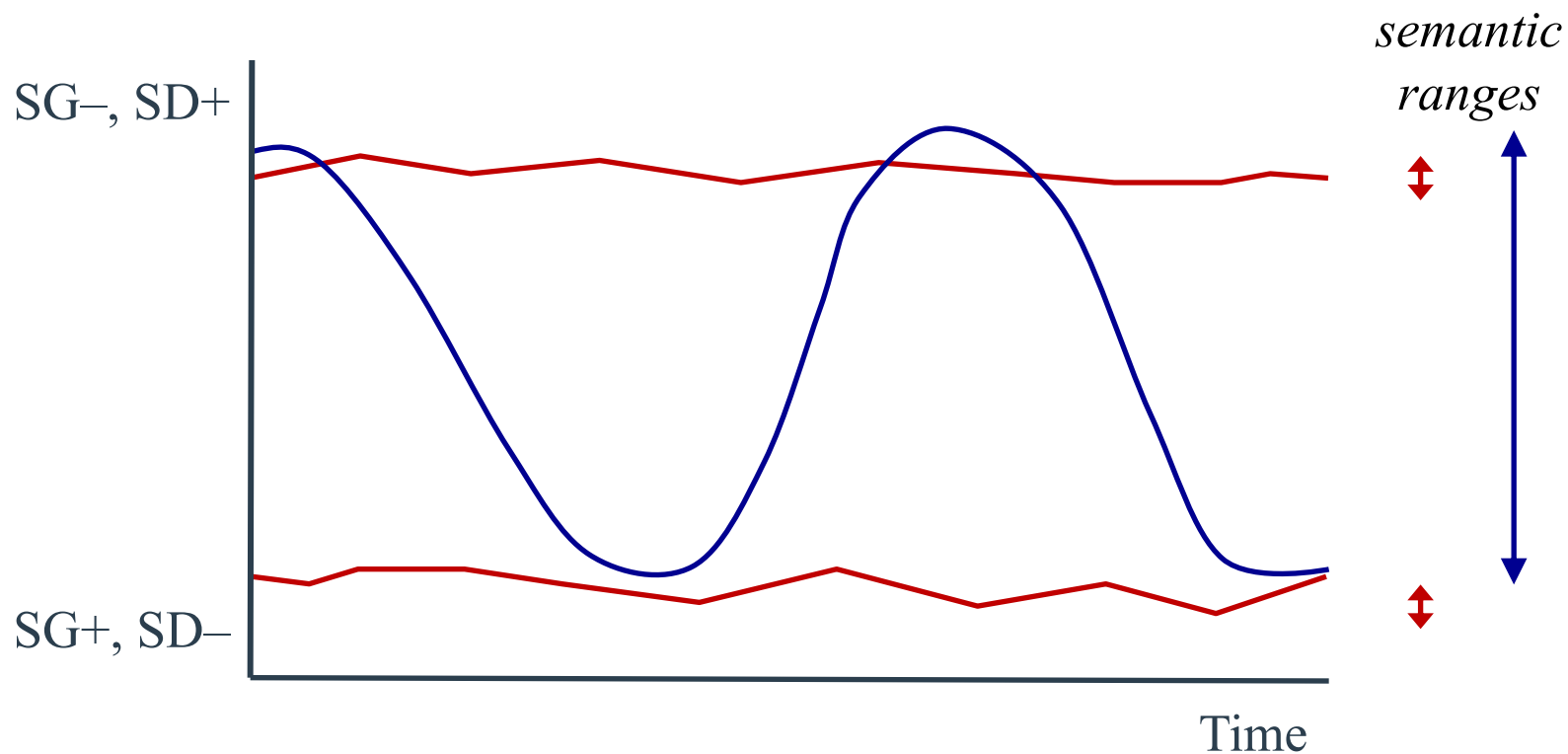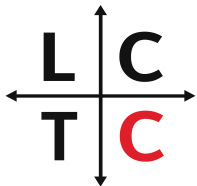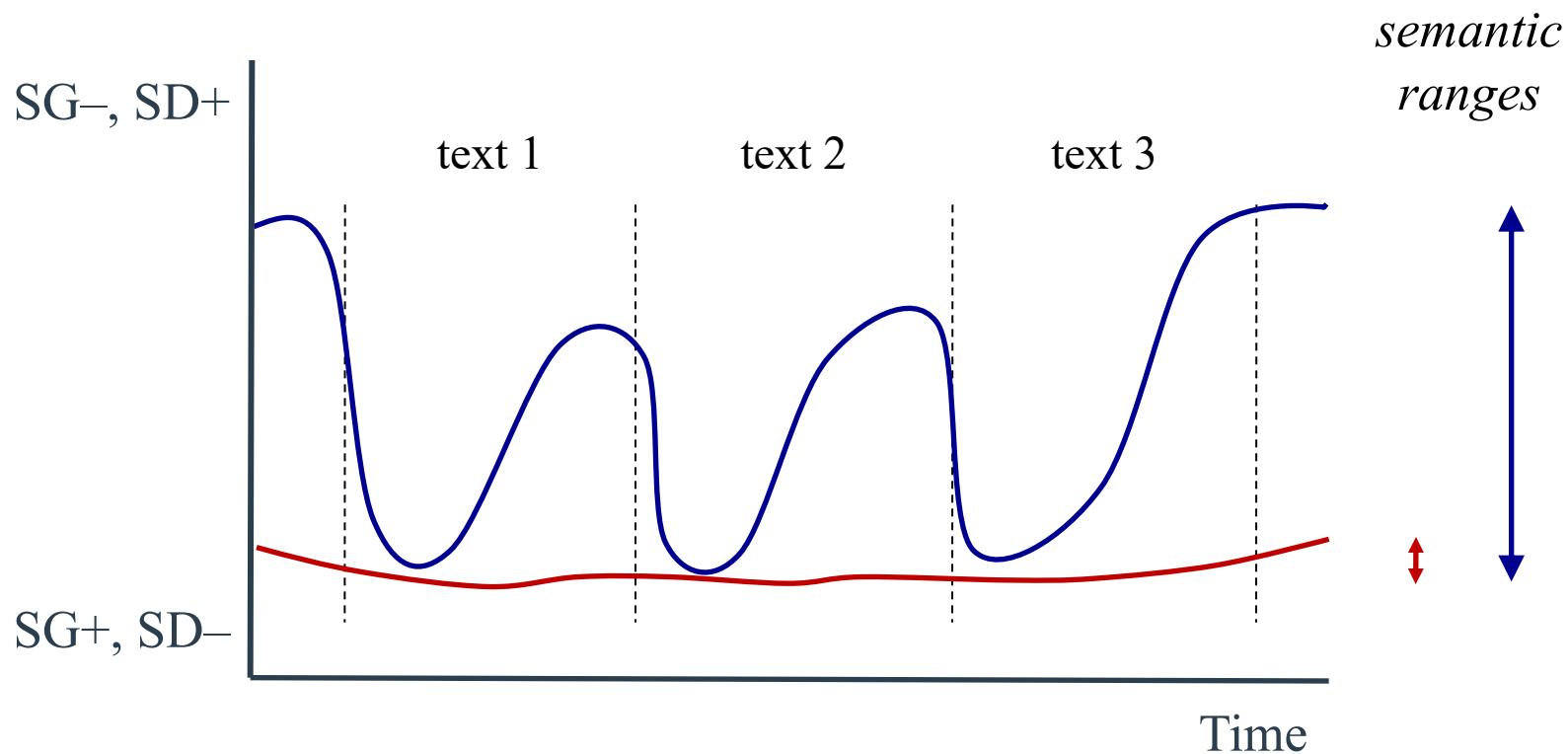
semantic ranges

Semantic ranges of students

SG–, SD+

SG+, SD–

Time

semantic ranges
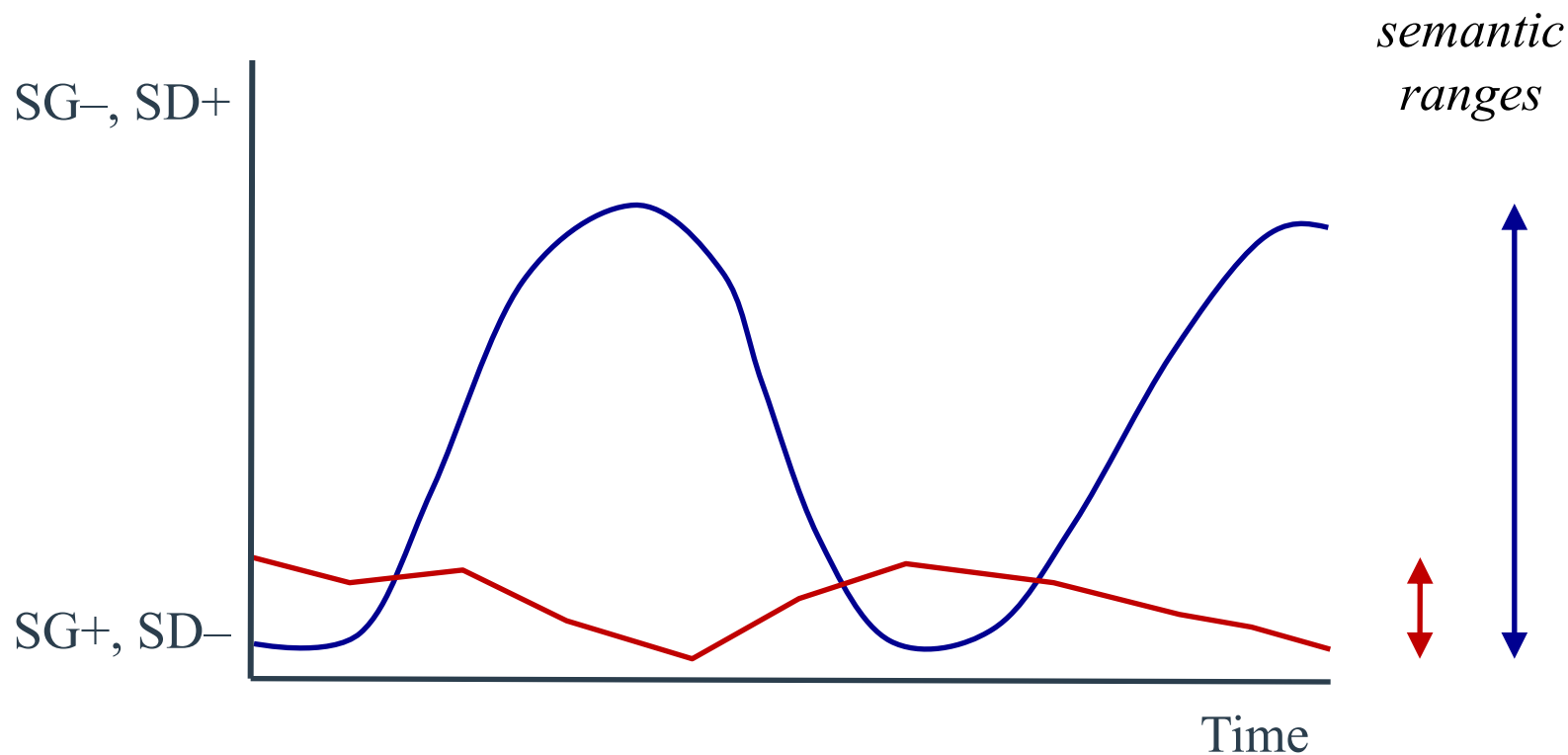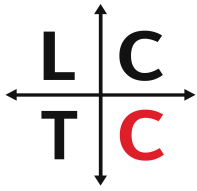
Making waves

- In teaching programmes
  - academic development
  - teacher training

- To shape their own teaching
  - lecturers
  - school teachers

- Curriculum design

- Explicitly teaching students to wave

Making waves in programmes

- Academic development in higher education
  - e.g. at Wits Uni, Rhodes Uni, UWC, CPUT, DUT, and Stellenbosch Uni in South Africa
  - engineering, philosophy, law, natural science, political science, and others
  - e.g. Clarence (2016), Wolff (in press)

- Teacher training course
  - pre-service teacher programmes: e.g. Wits Uni and Uni of Wollongong (Australia)
  - range of subjects, including science and Danish as Second Language

Making waves themselves

- Academics shaping own teaching
  - chemistry, TESOL, jazz, writing, engineering, ballet, linguistics, music education, and others
  - e.g. Blackie (2014)

- Teacher adoption
  - school teachers encountering ideas through pedagogic interventions and professional development across Australia
  - e.g. Macnaught *et al*. (2013)
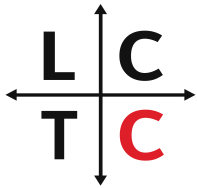
Making waves for others

- Curriculum development
  - selection, sequencing and pacing of different kinds of practices to create rising semantic waves
  - examples:
    - Diploma of Youth Work at Australian College of Applied Psychology
    - Cape Town School of Engineering
    - EAP, University of Hong Kong Shenzhen
    - EAP, National University of Singapore
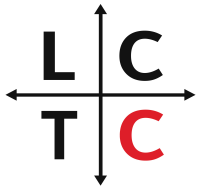
Teaching others to make waves

- Teaching LCT to students
  - social work, jazz, ballet, English Language Teaching, higher education studies, university bridging courses
  - Poland, Mexico, Australia, South Africa, UK…

- English for Academic Purposes
  - National Uni of Singapore: 1200+ students (Laetitia Monbec)
  - Uni of Durham (Steve Kirk; Kirk 2017)
  - Chinese Uni of Hong Kong Shenzhen: 300+ (Gina Roach)
  - Wenzhou Kean University, China (Gina Roach)
  - Navitas English – private language schools (Richard Ingold: Ingold & O'Sullivan 2017)

**Eszter Szenes,
Learning Centre,
University of Sydney**

CRITICAL REFLECTION IN THE SOCIAL AND HEALTH SCIENCES

1. WHAT IS CRITICAL REFLECTION?

Introduction

Critical reflection is increasingly assessed as a skill at undergraduate and postgraduate level in many different subjects. Definitions of critical reflection include the ability to 'create new professional knowledge' (Pockett & Giles, 2008) and have also been equated with the skills of problem-solving and decision-making highly valued by employers (Facione 2010). It is often associated with *research-, theory-* and *evidence-based praxis,* and being a reflective practitioner. In order to apprentice students into the discourses of these disciplines, students are often expected to apply various theoretical frameworks and methodologies learnt in university courses in preparing a response to a 'case' or a 'critical incident' (though journaling, fieldwork interviews and other qualitative research methods). It is often expected that by developing critical reflection students undergo a process of learning referred to as 'transformation'*,* that resu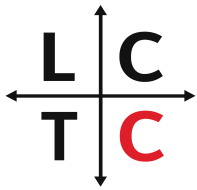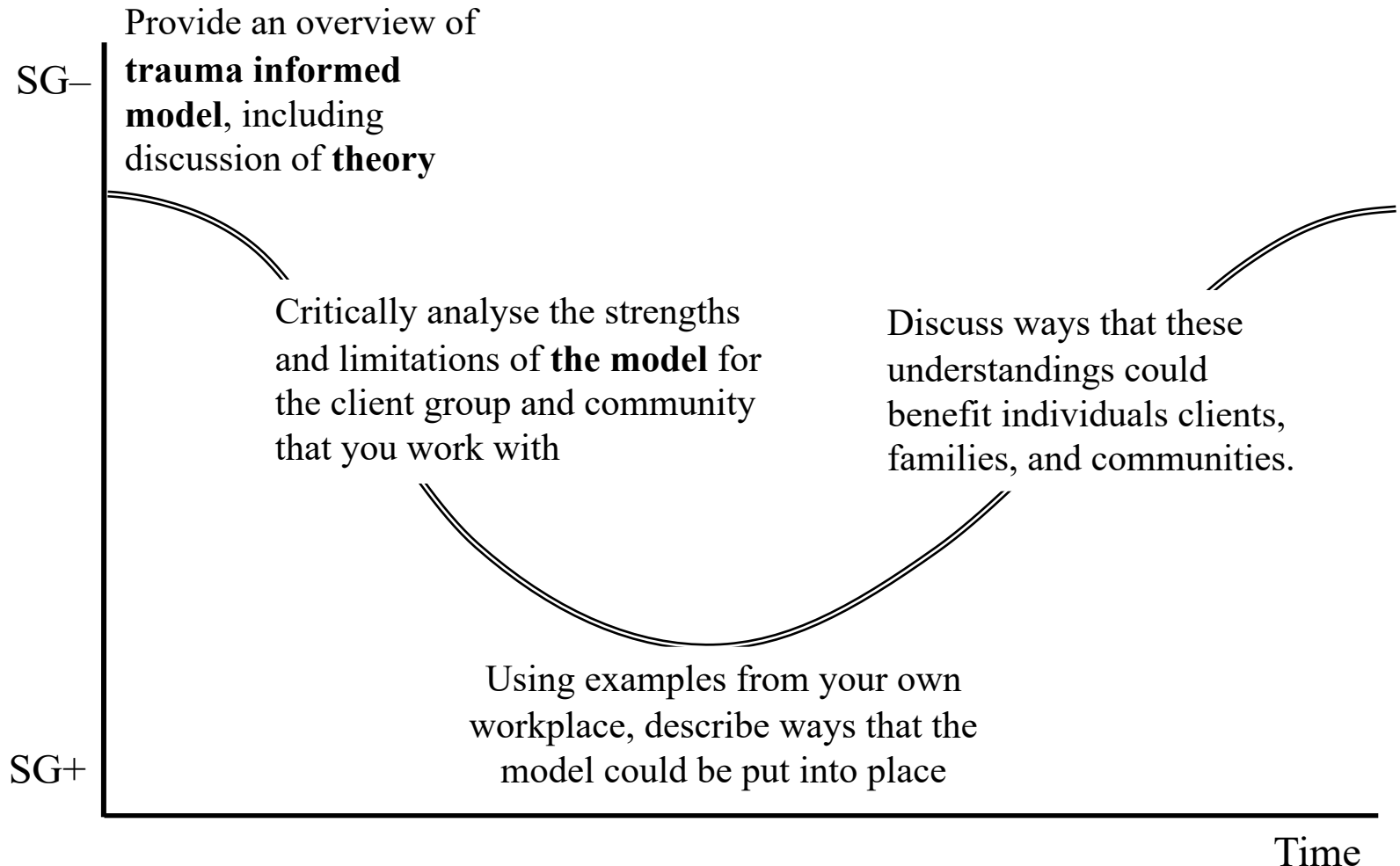lts in a re-examination or change of one's behaviour, professional practice or stance towards professional knowledge. These types of responses often require 'critical analysis' of and/or 'critical reflection' on a particular real-world problem and personal or professional experiences, sometimes followed by a theoretically informed decision or a recommendation to a course of action by an imagined client, business or government department. Critical reflection is often assessed through a wide variety of tools, such as learning and reflective journals, reports, reflection papers, case studies, or narratives. These types of assignments are increasingly popular in applied disciplines such as marketing, business, accounting, nursing, health sciences, social work or education. In this workshop we understand critical reflection to mean the ability to (1) relate personal and professional experiences to the theoretical concepts and/or frameworks of a particular discipline by weaving together subjective and objective knowledge and (2) transfer new skills beyond the context of a particular case.
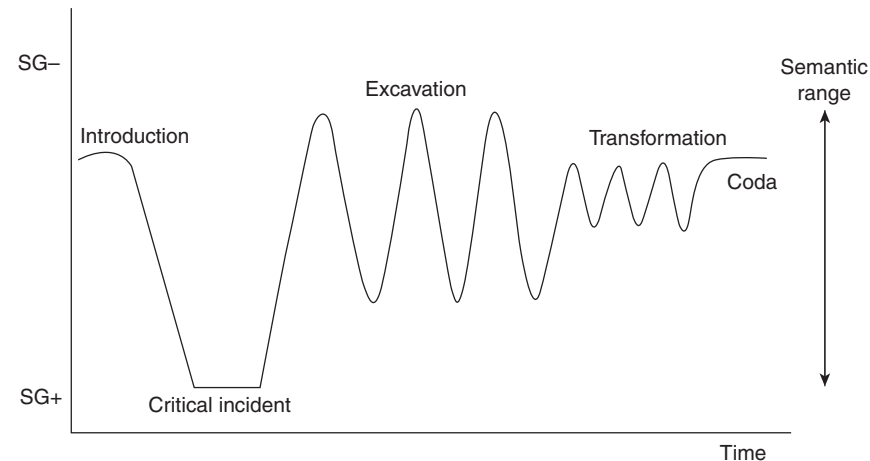
Semantic profile of a successful reflection essay in social work.

Profiling an assignment

SG–

Provide an overview of **trauma informed model**, including discussion of **theory**

Critically analyse the strengths and limitations of **the model** for the client group and community that you work with

Discuss ways that these understandings could benefit individuals clients, families, and communities.

Using examples from your own workplace, describe ways that the model could be put into place

SG+

Time

Planning your essay profile

SG–

overview of strengths-based approaches into child protection practice

When I reflect on the main themes or patterns emerging out of my narrative, there is a clear emphasis placed on notions of participation, dialogue and collaboration. This emphasis reflects an increasing interest in integrating strengths-based approaches into child protection practice. [...] professional work is defined as the articulation of expert knowledge, in favour of allowing clients to seize some control over decisions that are critical to their lives (Saleeby, 1997, pp 7-8).

The key stakeholders of the case – including Max's school principal his counsellor and youth worker from his supported accommodation service ...About half an hour into the meeting, Max began to 'become difficult', [...] Max replied, angry, 'I'd like to go back home, but it's not as though you're all listening to me, is it?" […]

SG+

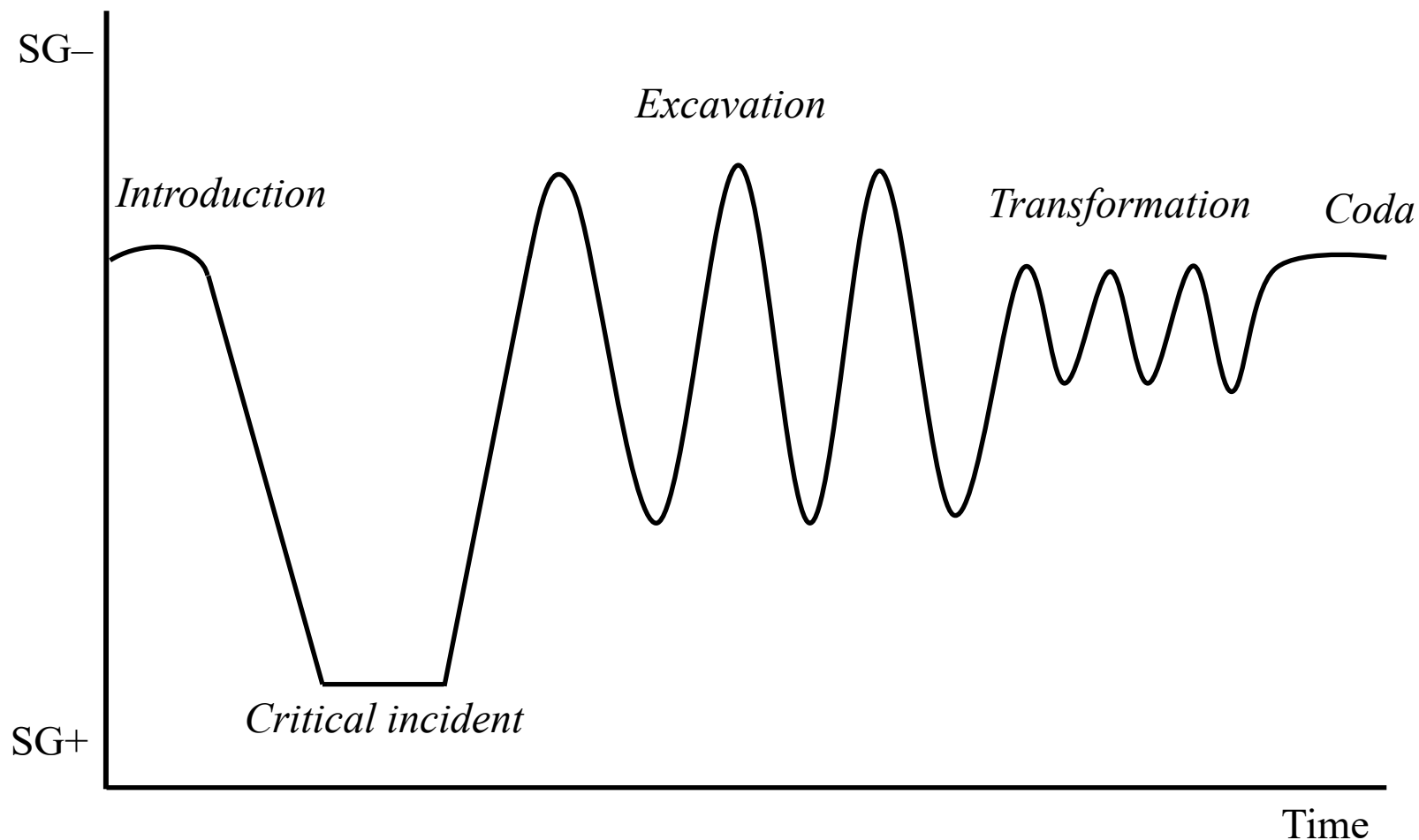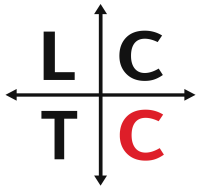Time

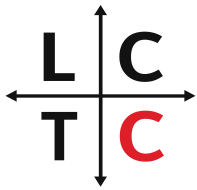# Critical reflection essay: business studies
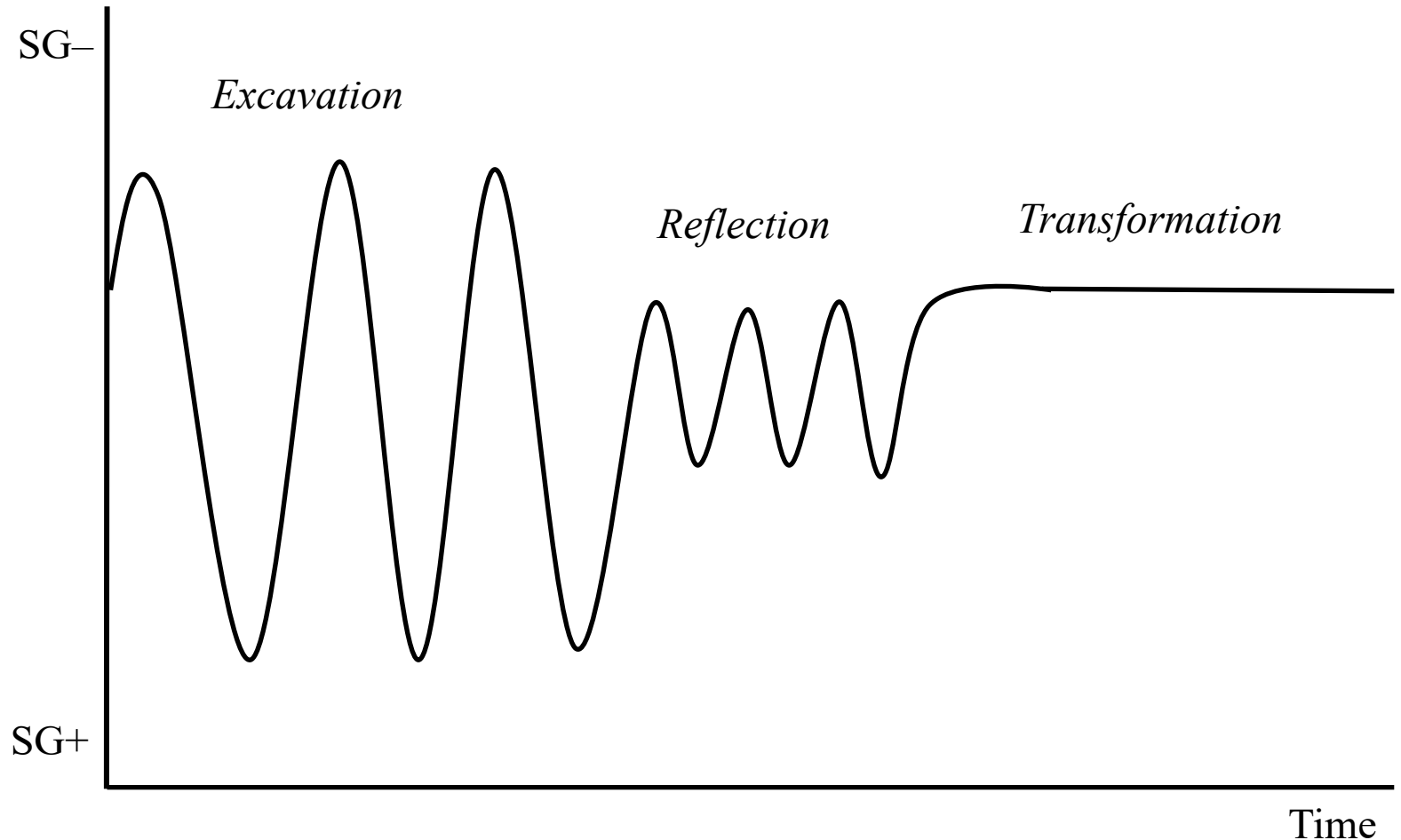
# Critical reflection essay: social work

Differences in profiles

- semantic range

- semantic shifts – going up Vs going down

- entry and exit points

- semantic flow

- semantic threshold (getting it right)

- what do SG+/–, SD+/– look like *here*?

Conclusions

- LCT concepts are not locked into specific contexts

- studies across institutional and disciplinary maps that can speak to each other

- explores both generic and subject-specific attributes of student success

- reveals 'rules of the game' that can be taught and learned, and changed
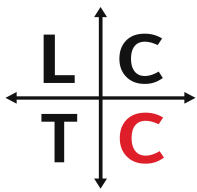
Conclusions

- semantic profiles significant for cumulative knowledge-building and learning

- maximising semantic range and ability to wave are issues of social justice

- LCT offers analysis:
  - of organising principles
  - of many kinds of practices
  - and change over time
  - with considerable semantic range