Making a niche for educational ecology as an applied science

Peter Goodyear

CRLI, Sydney School of Education & Social Work
The University of Sydney

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Modeling complex learning spaces

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Overview

1. Interview-based study:
   new course designs and integrated learning space
   (54 interviews with DVCEs, CIOs & Facilities directors from 39/42 Australian universities, 2016-17)

2. Foundations for educational ecology as an applied science

3. Reflections
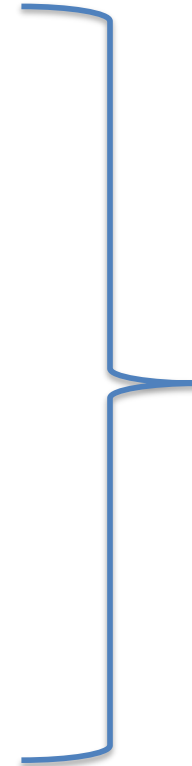
Part One & Part Two of the book

"The concept of ecology has a subtle *ought-ness*. If an ecosystem is found to be impaired, then one has a responsibility to help to restore it to good health. And so it is with the university."

(Ron Barnett, 2018, 8)

" … it is a mistake to presume that general laws are the only form of useful knowledge. Rather, ecology has been advancing significantly through the development of local causal mechanisms and approaches to testing for their occurrence in systems."
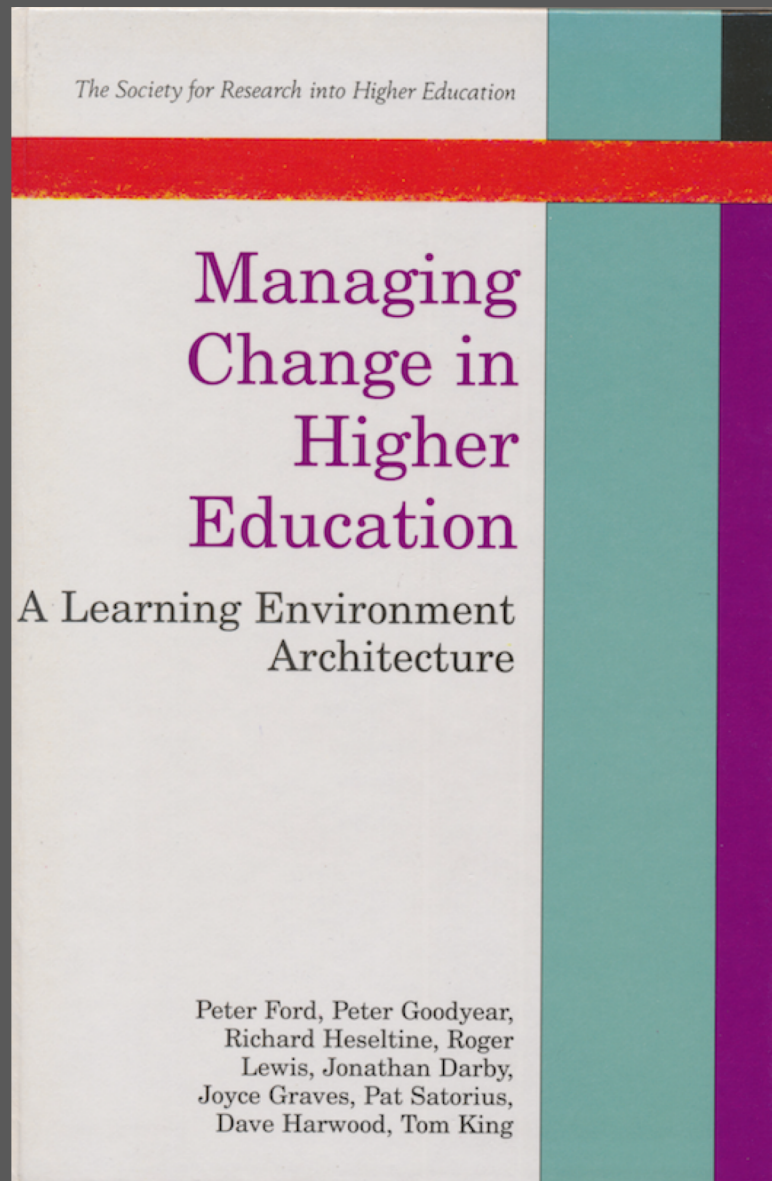
(David Hammer, Julia Gouvea & Jessica Watkins, 2018, 14)
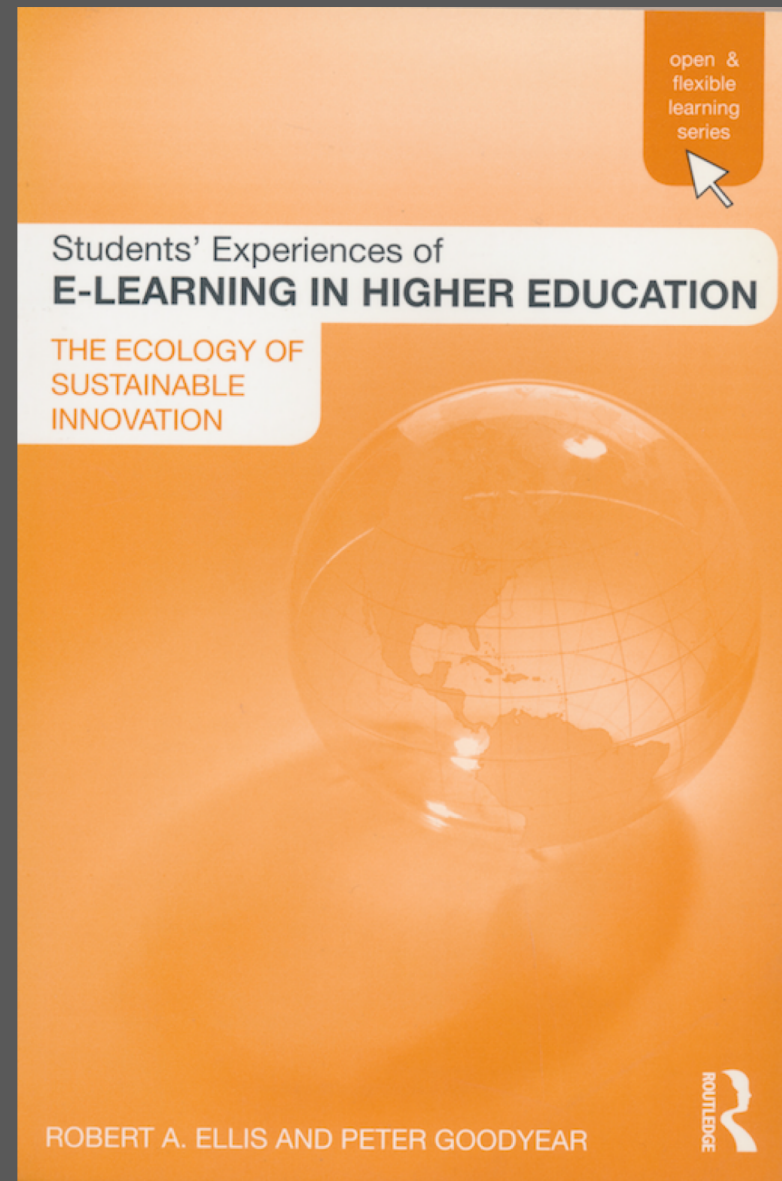
The Education Ecology of Universities

Integrating strategy, learning and the academy

Robert A Ellis and Peter Goodyear

SRHE/Routledge

The Society for Research into Higher Education

Managing Change in Higher Education

A Learning Environment Architecture

Peter Ford, Peter Goodyear, Richard Heseltine, Roger Lewis, Jonathan Darby, Joyce Graves, Pat Satorius, Dave Harwood, Tom King

Ford et al 1996

open & flexible learning series

Students' Experiences of
E-LEARNING IN HIGHER EDUCATION

THE ECOLOGY OF
SUSTAINABLE
INNOVATION

ROBERT A. ELLIS AND PETER GOODYEAR

Ellis & Goodyear 2010

Research Context

Avoiding reference to "The" University
> 200 million students, doubled since 2000, doubling again by 2030
> 6 million teachers
Between 18,500 and 26,500 universities

Australian Universities (with hints of UK, Northern Europe and US)

With some important caveats, Australian University System performing well in a time of rapid change
5% growth pa for 15 years
40% of 19 year olds enrolled in HE (18% in 1989)
39% of 25-34 year olds have a degree (27% in 2004)
3rd largest export earner ($31 Bn)
58% domestic students are female
2008 – 2016: 100% growth in students with disability, 89% in indigenous enrolments; 55% low SES; 48% rural & regional.

Table 1.1: Rankings on U21 analysis of higher education systems (compiled from Williams & Leahy, 2018, 6-16)

	Resources	Environment	Connectivity	Output	Overall
1	Switzerland	USA	Switzerland	USA	USA
2	Sweden	*Australia*	Austria	UK	Switzerland
3	Singapore	New Zealand	UK	*Australia*	UK
4	Denmark	Singapore	Netherlands	Switzerland	Sweden
5	Canada	Finland	Denmark	Denmark	Denmark
6	USA	Hong Kong	New Zealand	Sweden	Finland
7	Norway	UK	Sweden	Canada	Netherlands
8	Austria	Taiwan	Finland	Netherlands	Canada
9	Finland	Netherlands	Belgium	Finland	Singapore
10	Saudi Arabia	Belgium	Singapore	Israel	*Australia*
11	Netherlands	Switzerland	USA	Germany	Austria
12	Malaysia	Sweden	Canada	Belgium	Norway
13	Hong Kong	Canada	Germany	France	Belgium
14	*Australia*	Poland	*Australia*	Norway	New Zealand
15	Belgium	Malaysia	Ireland	Singapore	Germany

Staffing: work intensification & burn-out, fragmentation of work, precariat

Staffing Issues (Australian data)

Tenured core vs tenuous periphery (Megan Kimber, 2003)

Tenuous periphery (precariat)

- HE has 3rd highest proportion of casualised workers
  (after retail & health)

- 2012: 80% of first year undergrad teaching done by casual staff

- 2017: 94.5k people working casually; 123k on fixed-term or perm contracts

- Casual staff rarely included in course & curriculum planning meetings etc

Tenured core

- Intensification, fragmentation & burnout
  In conflict with educational innovation

Student Issues (Australian data)

- 20% of first year students & 25% of final year students rate their experience negatively

- 50% of students report they do not feel as sense of belonging with their university; only interact with other students when course requires; not interacting with students 'very different' from selves

- 50% do not feel they get useful feedback

- While supervisors report very positively on new graduates, it's unclear that a sharp sense of workplace capabilities is guiding WIL/employability course/curric reform

IT & Space issues

- Tech: from equity over access to good educational usage
  (from catering for the digital natives to asking if laptops should be banned in lectures; generic office apps)

- Well-considered 'blended' designs are widely appreciated

- Good provision for face-to-face learning activities that involve collaborative work and discussion, with light to moderate supervision by teaching staff, entails planning appropriately furnished physical learning spaces, with digital tools and infrastructure that support the students and the teacher(s) in their work

The Study: 3 Groups of Leaders

Education leaders ≅ Deputy Vice-Chancellor (Education) DVC(E)

IT leaders ≅ Chief Information Officer (CIO)

Facilities leaders ≅ Director of Estates (DoE)

Achieved Sample

DVCEs: 19   ⎫

CIOs: 18   ⎬   54

DoEs: 17   ⎭

Universities: 39   (of 42)

Interviewing Team

Nick Klomp
(formerly DVC Academic U Canberra; VC Central Queensland University)

Bruce Meikle
(formerly CIO University of Sydney)

Kenn Fisher
(Educational architect Woods Bagot & academic, U Melbourne)

Rob Ellis
(formerly Director of eLearning at The University of Sydney;
Dean L&T, Arts, Education & Law Group, Griffith U)

Semi-structured interview questions: DVCEs

1. What university-wide **frameworks guide course design** at your university?
    [Note: 'course design' interpreted broadly, to include program, course and credential design.]

2. What do the changes and challenges arising in this area mean for university teachers and students?

3. What strategies exist in your institution to address these challenges?

4. What institutional impediments need to be overcome for an effective university teaching and learning system that supports innovative course design?

5. How are **effective relations made between new course designs and integrated learning spaces**?
    [Note: 'integrated learning spaces' - integrations of physical and digital spaces, tools, resources etc, with the aim of supporting more 'seamless' learning and teaching.]

Semi-structured interview questions: CIOs and DoEs

1. How would you define 'learning space'? To what extent is that definition understood across your institution?

2. What **strategies** does your institution adopt to **plan and develop learning space**?

3. What can impede the effective development of learning space?

4. What things would you resolve to **improve effective learning space innovation and planning**?

Five emerging themes: organisational elements

1. **Strategy** … the means by which a university community decides on key priorities for courses, curricula, learning and teaching, learning spaces, learning resources, etc over the next time period
2. **Governance** … the mechanism by which the university implements strategy: how decisions are made, how progress is measured, how priorities are determined
3. **Policy** … policy frameworks tend to combine both statements of intent and procedural guidance (specifying mandated, desirable and/or prohibited actions). They provide means of connecting higher-level goals and values with specific actions 'on the ground'.
4. **Management** … the processes involved in controlling and guiding the activities of the people (teaching staff, providers of infrastructure, etc) whose work directly shapes learning opportunities and learning environments for students
5. **Funding** … the means by which the university provides resources that enable strategy to be shaped by governance and implemented through management processes; budget structure as well as quantity matters
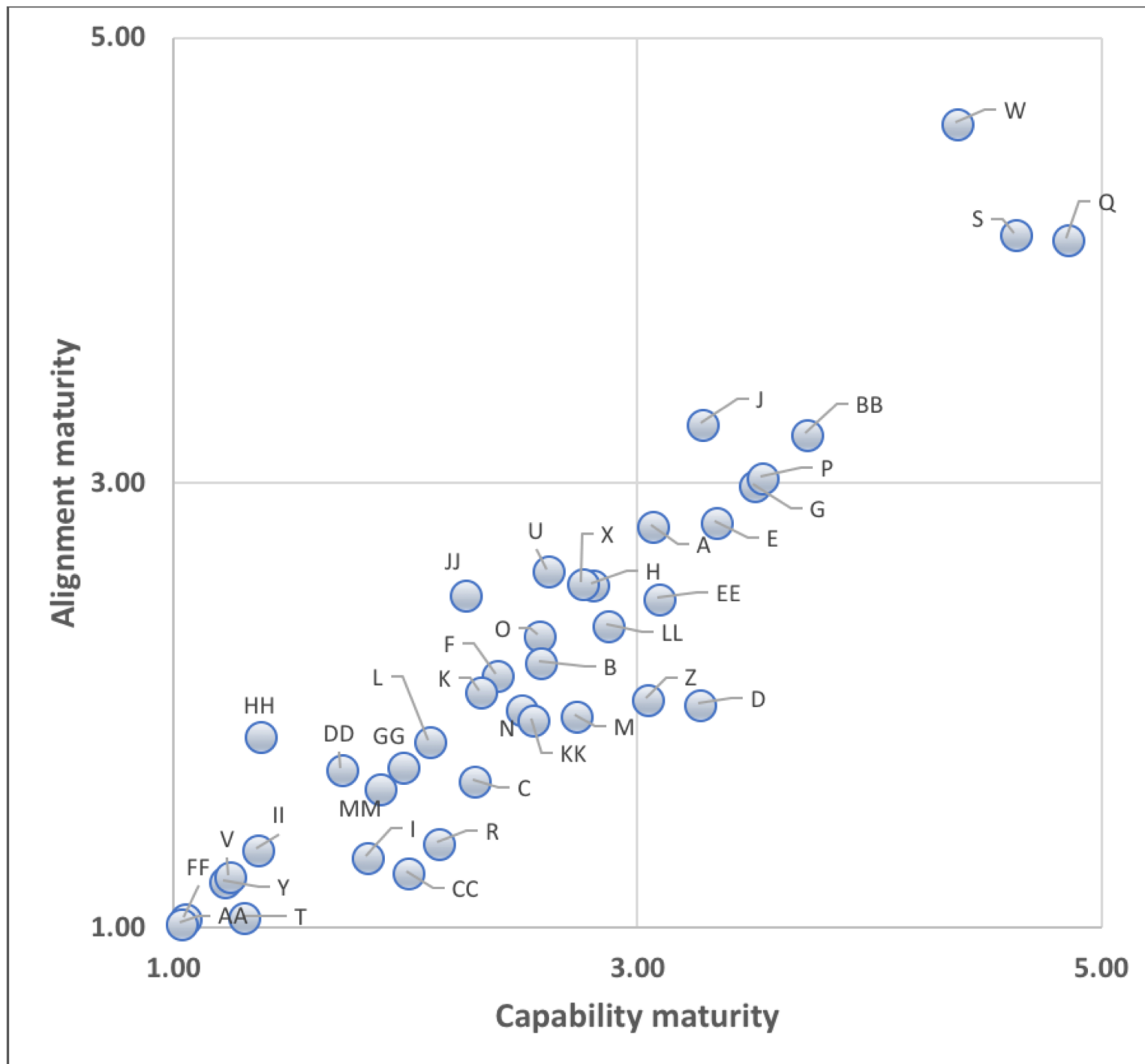
Expert judgement: capability and alignment

Table 2.2 Capability and alignment criteria

Elements & criteria	Strategy	Governance	Policy	Management	Funding
Capability criteria	Comprehensive Student-centred Teaching-informed Clear Shared ownership	Representative Integrated Effective Collaborative	Student-centred Outcomes-focused Practical Best practice Externally-aligned	Agile Engaged Quality assured Integrated Effective delivery	Well-structured Balanced Prioritised Risk-managed
Alignment criteria	Strategy effectively informs governance, management of its implementation within funding envelopes.	Governance directs strategy and oversees its effective management and funding.	Policy reflects strategy achieved through good governance in ways that can be effectively managed within funding envelope.	Management implements strategy, directed by governance, aligned with policy within funding envelopes.	Funding effectively realises the strategy, directed by governance, aligned with policy and implemented by management.

Scale from 1 (Very Poor) to 5 (Excellent)
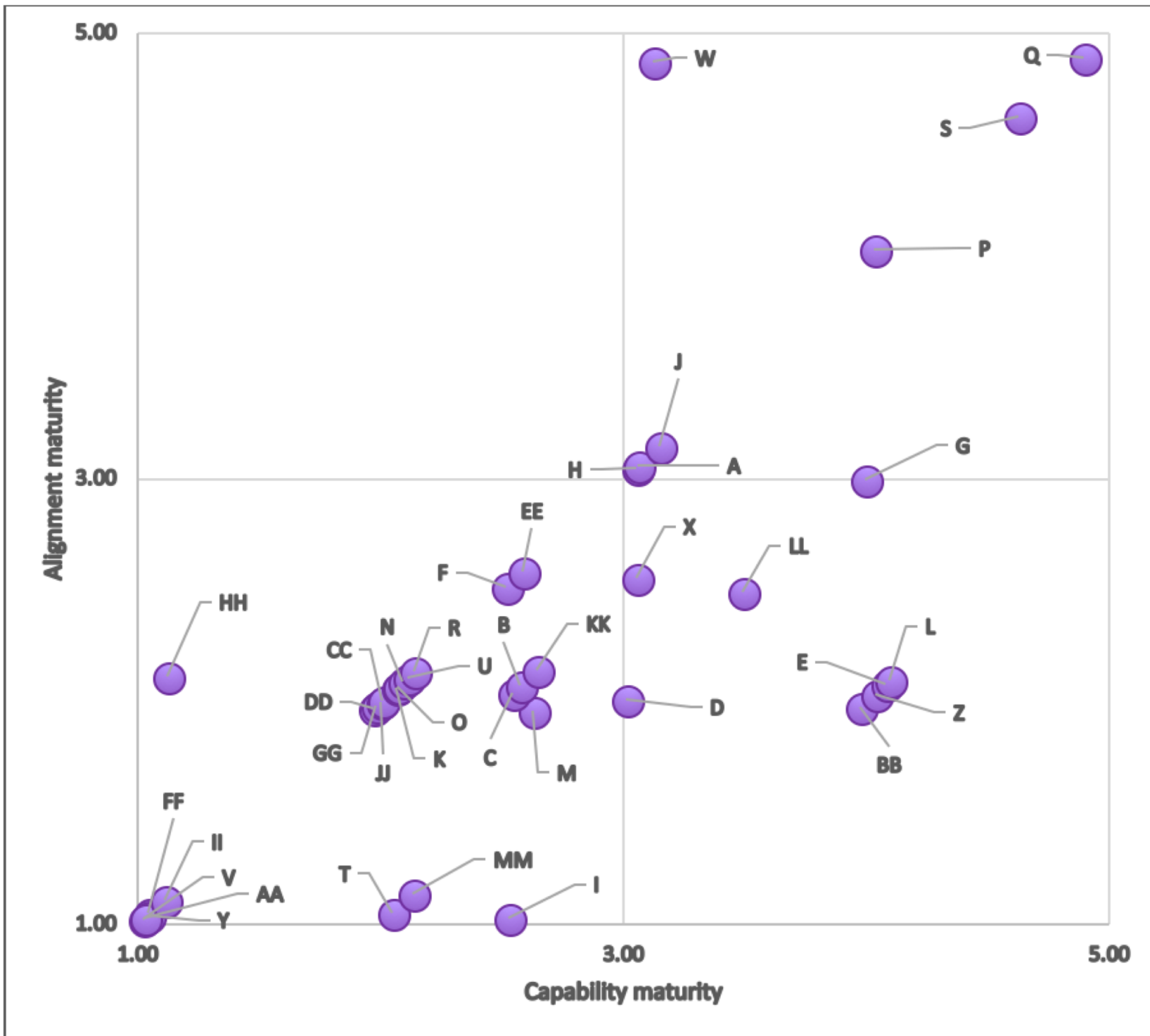
Strategy: capability x alignment

Figure 5.6: Capability and alignment across all five organisational elements (n=39)

Problematic Areas

1. **Quality Assurance (QA) x (Educational) Innovation**

2. **Professional development of teaching staff**

3. Difficulty of **integrating/aligning** the planning/design of new courses (etc), IT and physical spaces: need for students to be able to move seamlessly between learning spaces

4. Problems in **aligning** strategy, governance, policy, management and funding

5. Funding and **budgeting**

6. **Outcome measures x understanding processes** that produce the outcomes

7. **Lack of shared concepts and terminology** – esp. in relation to implications of new educational designs for IT and built infrastructure

8. Difficulty of pinning down user requirements:

   Configuring the user: managed customer; stereotypes & averages; folk psychology of teaching & learning
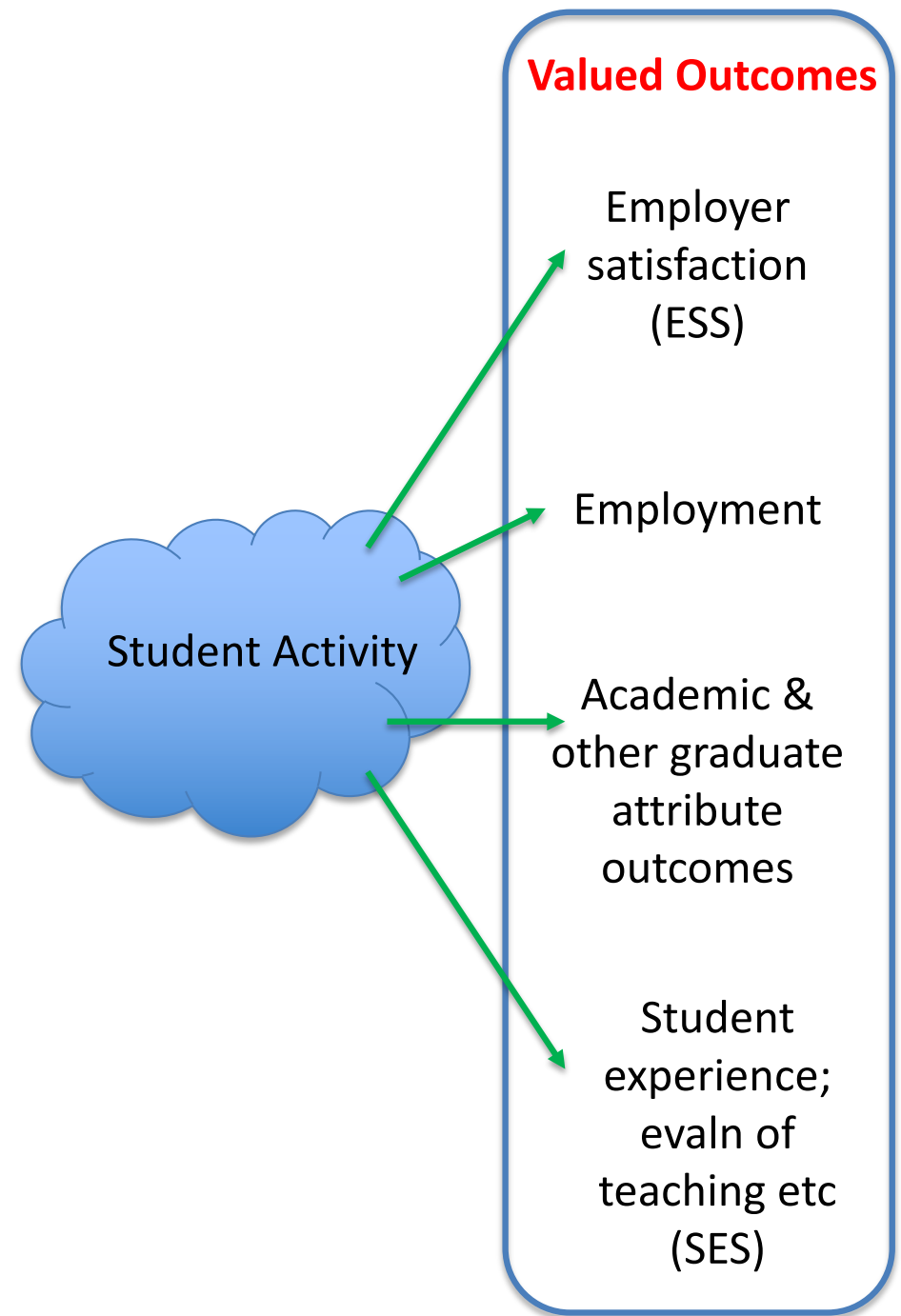
CIO

DoE

DVCE

Valued Outcomes

Employer satisfaction (ESS)

Employment

Academic & other graduate attribute outcomes

Student experience; evaln of teaching etc (SES)

Valued Outcomes

Student Activity

Employer satisfaction (ESS)

Employment

Academic & other graduate attribute outcomes

Student experience; evaln of teaching etc (SES)

Valued Outcomes

Learning Environment

Meshwork of tasks, tools, spaces, people

Materially & Digitally Situated

Epistemically Situated

Student Activity

Socially Situated

Coupled developmental system
Student & Environment

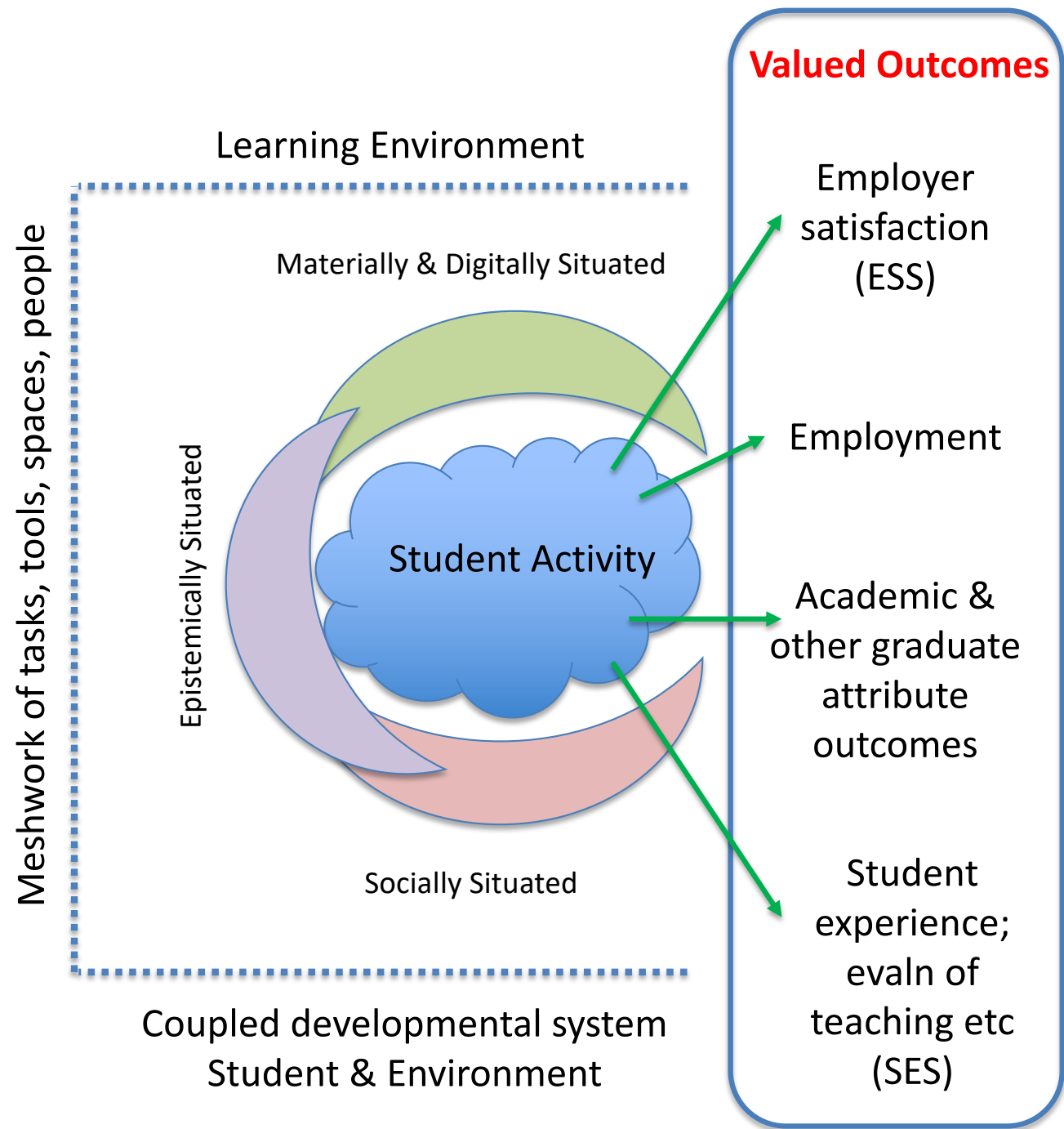Employer satisfaction (ESS)

Employment

Academic & other graduate attribute outcomes

Student experience; evaln of teaching etc (SES)

CIO ┈┈┈┈➤ 'Middle Managers' ┈┈┈┈➤ Frontline IT staff

DoE ┈┈┈➤ 'Middle Managers' ┈┈┈➤ Frontline Estates staff

DVCE
Ed Innovation & Dev staff
Assoc Deans L&T
Program Convenors
Teaching staff

Materially & Digitally Situated

Epistemically Situated

Student Activity

Socially Situated
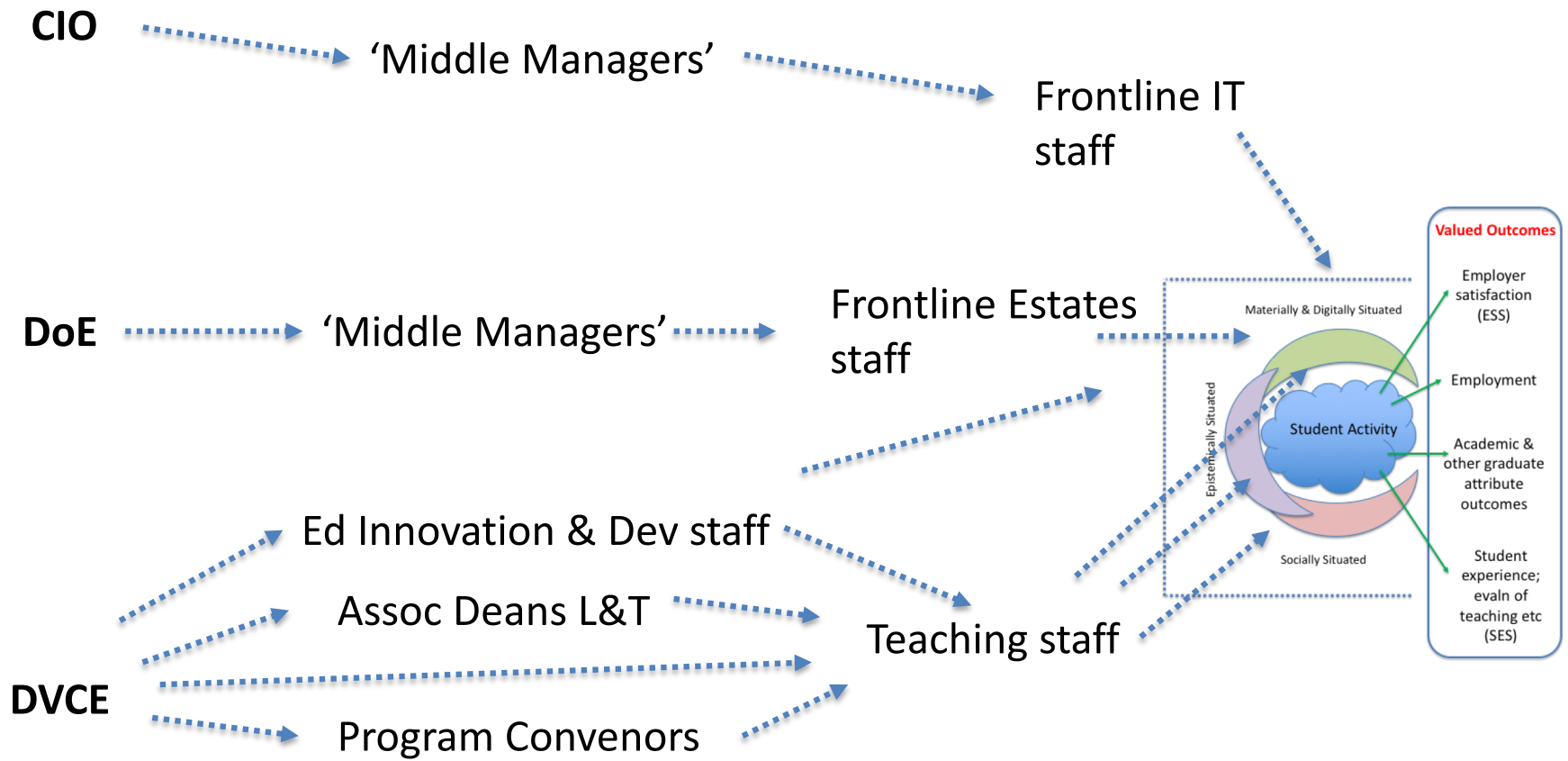
Valued Outcomes

Employer satisfaction (ESS)

Employment

Academic & other graduate attribute outcomes

Student experience; evaln of teaching etc (SES)

Core challenge: understanding and (indirectly & partially) shaping learning environments & activity systems

Applied Educational Ecology

Concepts & methods for
understanding and shaping
local learning systems

Educational ecology is an applied science that studies and
shapes learning systems. A learning system is a dynamic
coupling of people and the multifarious resources on which
they are drawing in order to learn.

People and environments change each other.

Applied Educational Ecology

Chapter 6: Service Design
    From product-oriented to service-oriented design
Chapter 7: Learning in Activity Systems
    From the individual student (or course or cohort) to
    situated learning & activity systems
Chapter 8: Educational ecology as an applied science
Chapter 9: Educational ecology: ways and means

Applied Educational Ecology

Chapter 8: Educational ecology as an applied science

Barnett (2018): Seven ecological zones

Bain & Zundans-Fraser (2017): Self-organising university

Luckin (2010): Ecology of resources

Bronfenbrenner (1979):

    Micro-, meso-, exo- and macro-systems

Hutchins (2010): Cognitive ecology (and person+)

Barnett's Seven Ecological Zones

Ecological zone
Knowledge ecology
The ecology of social institutions
Persons
The economy (considered as an ecology)
Learning
Culture
The natural environment

Bain & Zundans-Fraser:
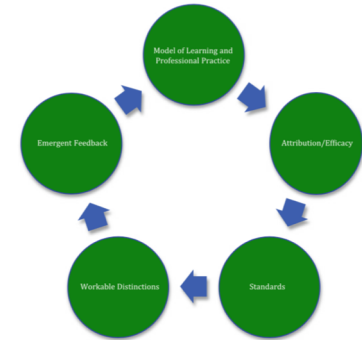# Learning & Teaching Context Cycle

Fig. 1.3 The learning and teaching context cycle

1. Attribution and efficacy: connecting models of teaching and learning to their outcomes

2. Standards: enabling professional standards to discriminate between good and poor practice; requires adoption of protocols for comparable and visible evidence-based practice

3. Workable distinctions in the day-to-day practices of learning and teaching, allowing evidence-based comparison of what works well, for whom, where and why.

4. Emergent feedback: use of actionable, real-time, knowledgeable, feedback from all parties

5. A shared model of learning and professional practice.

Key messages: macro to micro

1. Activities within a university are enmeshed in seven much wider ecological zones (Barnett)

2. The university as a self-organising, self-improving system, noting that the capacities for self-regulation and self-improvement depend upon timely flows of actionable knowledge and the means to make and explain evaluative judgements about the quality of the educational work being done

3. Clearer recognition of the importance of materials and their properties: for a better understanding of how the physical (material, digital, hybrid) environment and its tools, artefacts, spaces etc function in educational ecologies.

4. Reimagining the acting and learning student: setting university discourse free from the limitations of individualistic folk psychology (and the 'managed student').

Applied Educational Ecology

Chapter 9: Educational ecology: ways & means

Participatory approaches to understanding local learning systems
- Soft Systems Methodology (Checkland, Ison)
- Realist Formative Evaluation (Pawson & Tilley)
- Formative Intervention (Engeström)
- Participatory Design-Based Research (Bang et al)

Institutional infrastructure for educational ecology
- Research-Practice Partnerships (Penuel & Gallagher)

General Reflections

The value of recursiveness in approaches to analyzing and designing/producing complex (local) learning systems (students, teachers, leaders)

Strategies that resolve rather than exacerbate tensions (esp. between teaching, research & service) – Connected Curriculum; Students as Partners; Learning to Co-Design Relational services & epistemic envs

Under-theorization of learning environments in ed tech

Realist explanations not correlations between proxy variables

Thanks

Further info:

petergoodyear.net
peter.goodyear@sydney.edu.au