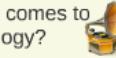




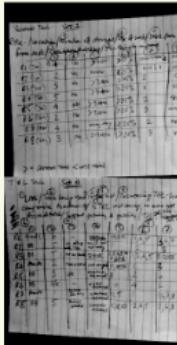
what stops people using technology?

a problems and benefits hierarchy for the uptake of technology enhanced learning in higher education

why is learning and teaching *mostly* so far behind real life when it comes to technology?



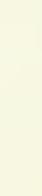
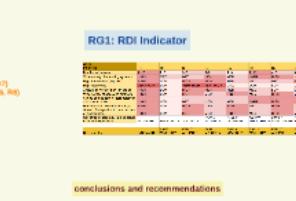
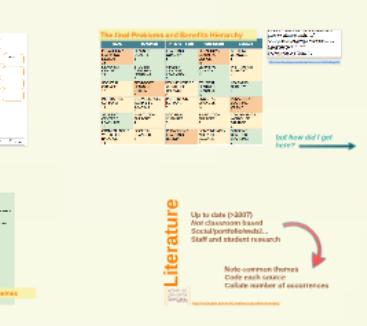
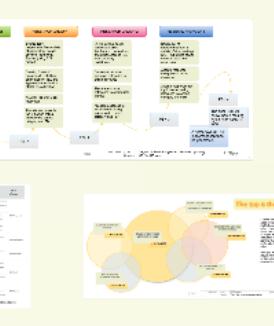
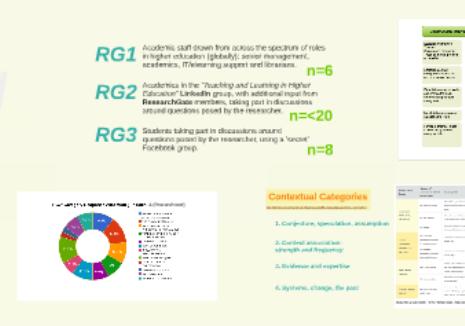
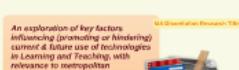
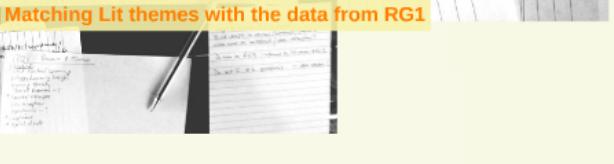
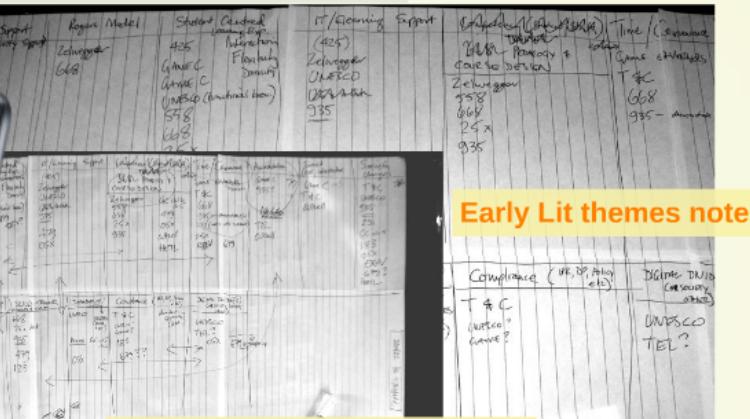
why is technology training of staff *mostly* so badly attended?



Raw Data from RG1 Technical Profiling Questions

<http://www.thedailycrete.com/2014/09/01/green-tech-advice-guidance-computer-vs-smartphone/>

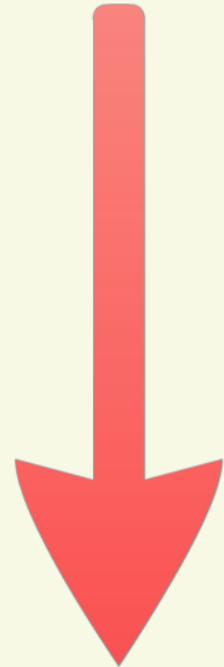
Category	Sub-category	Rogers Model	Student	Classroom	Learning style	Technology	Support
1. Institutional Support	2. Technology Support	Zelwegger	425	425	1. Individual	1. Computer	1. General
Zelwegger	Zelwegger	668	668	668	2. Diversity	2. Mobile	2. Personal
Zelwegger	Zelwegger	668	668	668	3. Flexibility	3. Internet	3. Games
Zelwegger	Zelwegger	668	668	668	4. Sociality	4. Personal	4. Collaboration
Zelwegger	Zelwegger	668	668	668	5. Novelty	5. Personal	5. Learning
Zelwegger	Zelwegger	668	668	668	6. Directness	6. Personal	6. Personal
Zelwegger	Zelwegger	668	668	668	7. Depth	7. Personal	7. Personal
Zelwegger	Zelwegger	668	668	668	8. Broadness	8. Personal	8. Personal
Zelwegger	Zelwegger	668	668	668	9. Novelty	9. Personal	9. Personal
Zelwegger	Zelwegger	668	668	668	10. Complexity	10. Personal	10. Personal
Zelwegger	Zelwegger	668	668	668	11. Depth	11. Personal	11. Personal
Zelwegger	Zelwegger	668	668	668	12. Broadness	12. Personal	12. Personal
Zelwegger	Zelwegger	668	668	668	13. Novelty	13. Personal	13. Personal
Zelwegger	Zelwegger	668	668	668	14. Depth	14. Personal	14. Personal
Zelwegger	Zelwegger	668	668	668	15. Broadness	15. Personal	15. Personal
Zelwegger	Zelwegger	668	668	668	16. Novelty	16. Personal	16. Personal
Zelwegger	Zelwegger	668	668	668	17. Depth	17. Personal	17. Personal
Zelwegger	Zelwegger	668	668	668	18. Broadness	18. Personal	18. Personal
Zelwegger	Zelwegger	668	668	668	19. Novelty	19. Personal	19. Personal
Zelwegger	Zelwegger	668	668	668	20. Depth	20. Personal	20. Personal
Zelwegger	Zelwegger	668	668	668	21. Broadness	21. Personal	21. Personal
Zelwegger	Zelwegger	668	668	668	22. Novelty	22. Personal	22. Personal
Zelwegger	Zelwegger	668	668	668	23. Depth	23. Personal	23. Personal
Zelwegger	Zelwegger	668	668	668	24. Broadness	24. Personal	24. Personal
Zelwegger	Zelwegger	668	668	668	25. Novelty	25. Personal	25. Personal
Zelwegger	Zelwegger	668	668	668	26. Depth	26. Personal	26. Personal
Zelwegger	Zelwegger	668	668	668	27. Broadness	27. Personal	27. Personal
Zelwegger	Zelwegger	668	668	668	28. Novelty	28. Personal	28. Personal
Zelwegger	Zelwegger	668	668	668	29. Depth	29. Personal	29. Personal
Zelwegger	Zelwegger	668	668	668	30. Broadness	30. Personal	30. Personal
Zelwegger	Zelwegger	668	668	668	31. Novelty	31. Personal	31. Personal
Zelwegger	Zelwegger	668	668	668	32. Depth	32. Personal	32. Personal
Zelwegger	Zelwegger	668	668	668	33. Broadness	33. Personal	33. Personal
Zelwegger	Zelwegger	668	668	668	34. Novelty	34. Personal	34. Personal
Zelwegger	Zelwegger	668	668	668	35. Depth	35. Personal	35. Personal
Zelwegger	Zelwegger	668	668	668	36. Broadness	36. Personal	36. Personal
Zelwegger	Zelwegger	668	668	668	37. Novelty	37. Personal	37. Personal
Zelwegger	Zelwegger	668	668	668	38. Depth	38. Personal	38. Personal
Zelwegger	Zelwegger	668	668	668	39. Broadness	39. Personal	39. Personal
Zelwegger	Zelwegger	668	668	668	40. Novelty	40. Personal	40. Personal
Zelwegger	Zelwegger	668	668	668	41. Depth	41. Personal	41. Personal
Zelwegger	Zelwegger	668	668	668	42. Broadness	42. Personal	42. Personal
Zelwegger	Zelwegger	668	668	668	43. Novelty	43. Personal	43. Personal
Zelwegger	Zelwegger	668	668	668	44. Depth	44. Personal	44. Personal
Zelwegger	Zelwegger	668	668	668	45. Broadness	45. Personal	45. Personal
Zelwegger	Zelwegger	668	668	668	46. Novelty	46. Personal	46. Personal
Zelwegger	Zelwegger	668	668	668	47. Depth	47. Personal	47. Personal
Zelwegger	Zelwegger	668	668	668	48. Broadness	48. Personal	48. Personal
Zelwegger	Zelwegger	668	668	668	49. Novelty	49. Personal	49. Personal
Zelwegger	Zelwegger	668	668	668	50. Depth	50. Personal	50. Personal
Zelwegger	Zelwegger	668	668	668	51. Broadness	51. Personal	51. Personal
Zelwegger	Zelwegger	668	668	668	52. Novelty	52. Personal	52. Personal
Zelwegger	Zelwegger	668	668	668	53. Depth	53. Personal	53. Personal
Zelwegger	Zelwegger	668	668	668	54. Broadness	54. Personal	54. Personal
Zelwegger	Zelwegger	668	668	668	55. Novelty	55. Personal	55. Personal
Zelwegger	Zelwegger	668	668	668	56. Depth	56. Personal	56. Personal
Zelwegger	Zelwegger	668	668	668	57. Broadness	57. Personal	57. Personal
Zelwegger	Zelwegger	668	668	668	58. Novelty	58. Personal	58. Personal
Zelwegger	Zelwegger	668	668	668	59. Depth	59. Personal	59. Personal
Zelwegger	Zelwegger	668	668	668	60. Broadness	60. Personal	60. Personal
Zelwegger	Zelwegger	668	668	668	61. Novelty	61. Personal	61. Personal
Zelwegger	Zelwegger	668	668	668	62. Depth	62. Personal	62. Personal
Zelwegger	Zelwegger	668	668	668	63. Broadness	63. Personal	63. Personal
Zelwegger	Zelwegger	668	668	668	64. Novelty	64. Personal	64. Personal
Zelwegger	Zelwegger	668	668	668	65. Depth	65. Personal	65. Personal
Zelwegger	Zelwegger	668	668	668	66. Broadness	66. Personal	66. Personal
Zelwegger	Zelwegger	668	668	668	67. Novelty	67. Personal	67. Personal
Zelwegger	Zelwegger	668	668	668	68. Depth	68. Personal	68. Personal
Zelwegger	Zelwegger	668	668	668	69. Broadness	69. Personal	69. Personal
Zelwegger	Zelwegger	668	668	668	70. Novelty	70. Personal	70. Personal
Zelwegger	Zelwegger	668	668	668	71. Depth	71. Personal	71. Personal
Zelwegger	Zelwegger	668	668	668	72. Broadness	72. Personal	72. Personal
Zelwegger	Zelwegger	668	668	668	73. Novelty	73. Personal	73. Personal
Zelwegger	Zelwegger	668	668	668	74. Depth	74. Personal	74. Personal
Zelwegger	Zelwegger	668	668	668	75. Broadness	75. Personal	75. Personal
Zelwegger	Zelwegger	668	668	668	76. Novelty	76. Personal	76. Personal
Zelwegger	Zelwegger	668	668	668	77. Depth	77. Personal	77. Personal
Zelwegger	Zelwegger	668	668	668	78. Broadness	78. Personal	78. Personal
Zelwegger	Zelwegger	668	668	668	79. Novelty	79. Personal	79. Personal
Zelwegger	Zelwegger	668	668	668	80. Depth	80. Personal	80. Personal
Zelwegger	Zelwegger	668	668	668	81. Broadness	81. Personal	81. Personal
Zelwegger	Zelwegger	668	668	668	82. Novelty	82. Personal	82. Personal
Zelwegger	Zelwegger	668	668	668	83. Depth	83. Personal	83. Personal
Zelwegger	Zelwegger	668	668	668	84. Broadness	84. Personal	84. Personal
Zelwegger	Zelwegger	668	668	668	85. Novelty	85. Personal	85. Personal
Zelwegger	Zelwegger	668	668	668	86. Depth	86. Personal	86. Personal
Zelwegger	Zelwegger	668	668	668	87. Broadness	87. Personal	87. Personal
Zelwegger	Zelwegger	668	668	668	88. Novelty	88. Personal	88. Personal
Zelwegger	Zelwegger	668	668	668	89. Depth	89. Personal	89. Personal
Zelwegger	Zelwegger	668	668	668	90. Broadness	90. Personal	90. Personal
Zelwegger	Zelwegger	668	668	668	91. Novelty	91. Personal	91. Personal
Zelwegger	Zelwegger	668	668	668	92. Depth	92. Personal	92. Personal
Zelwegger	Zelwegger	668	668	668	93. Broadness	93. Personal	93. Personal
Zelwegger	Zelwegger	668	668	668	94. Novelty	94. Personal	94. Personal
Zelwegger	Zelwegger	668	668	668	95. Depth	95. Personal	95. Personal
Zelwegger	Zelwegger	668	668	668	96. Broadness	96. Personal	96. Personal
Zelwegger	Zelwegger	668	668	668	97. Novelty	97. Personal	97. Personal
Zelwegger	Zelwegger	668	668	668	98. Depth	98. Personal	98. Personal
Zelwegger	Zelwegger	668	668	668	99. Broadness	99. Personal	99. Personal
Zelwegger	Zelwegger	668	668	668	100. Novelty	100. Personal	100. Personal



a problems and benefits hierarchy for the uptake of technology enhanced learning in higher education



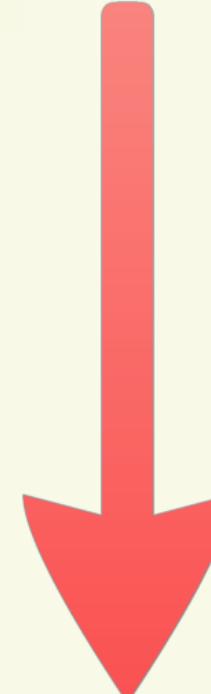
what stops people
using technology?



**why is learning and
teaching *mostly* so
far behind real life
when it comes to
technology?**



why is technology
training of staff
mostly so badly
attended?

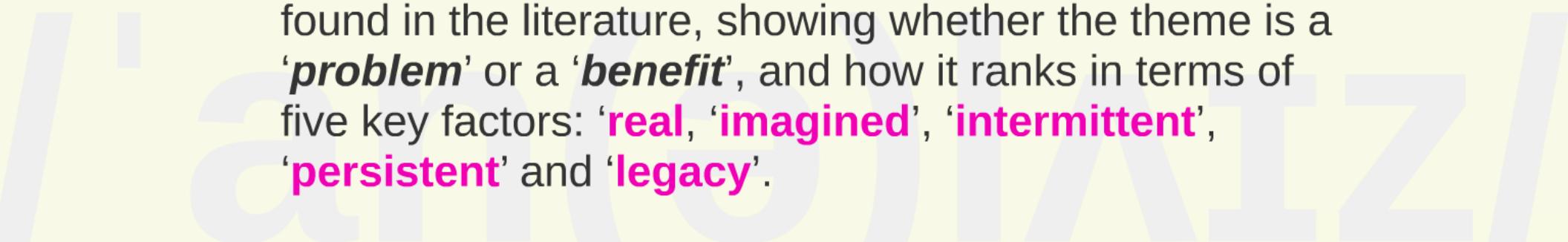


*An exploration of key factors
influencing (promoting or hindering)
current & future use of technologies
in Learning and Teaching, with
relevance to metropolitan
universities*

MA Dissertation Research Title

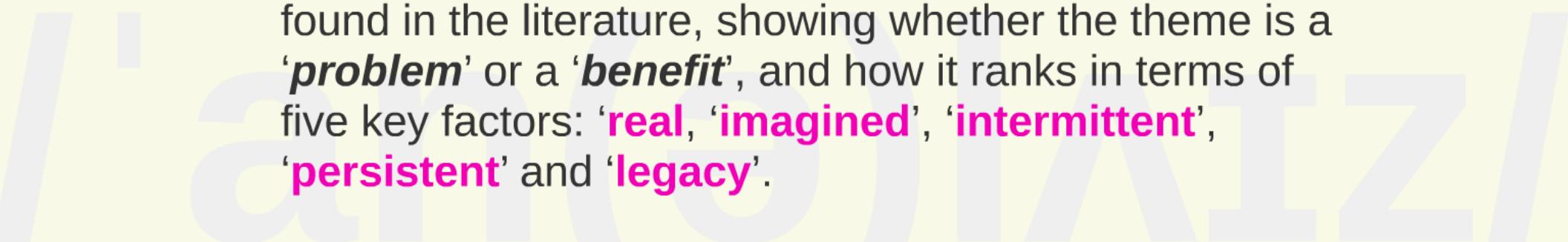


<http://webteach.penworks.net/maresearch/>



→ A **Problems and Benefits Hierarchy**, which includes two strata of ranking for the most popular themes found in the literature, showing whether the theme is a '**problem**' or a '**benefit**', and how it ranks in terms of five key factors: '**real**', '**'imagined'**', '**'intermittent'**', '**'persistent'** and '**legacy**'.

This would be further developed and analysed using additional **primary data** derived from **3 distinct response groups**.



←

RG1

Academic staff drawn from across the spectrum of roles in higher education (globally): senior management, academics, IT/elearning support and librarians.

n=6

RG2

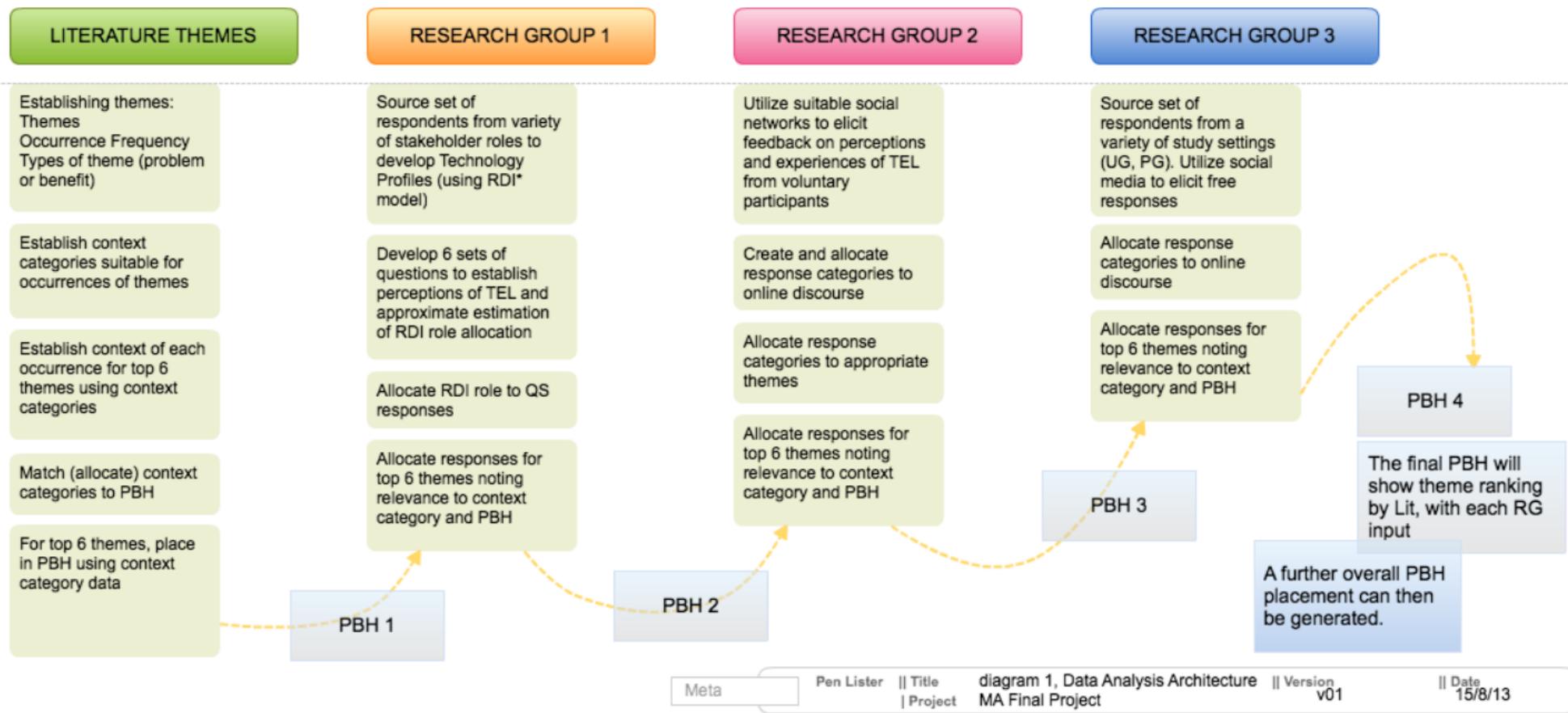
Academics in the "*Teaching and Learning in Higher Education*" **LinkedIn** group, with additional input from **ResearchGate** members, taking part in discussions around questions posed by the researcher.

n=<20

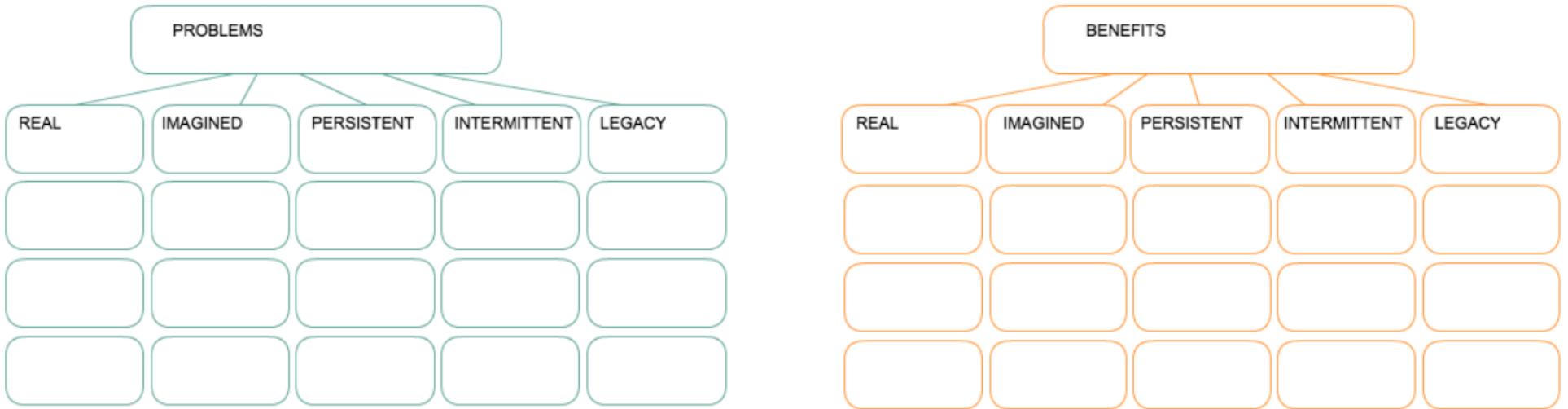
RG3

Students taking part in discussions around questions posed by the researcher, using a 'secret' Facebook group.

n=8



Contextual Scope	Types of context in scope (examples)	Description	PBH Factor
	PA - Personal Assumption	statement from a personal or individual standpoint with no evidence or expertise	



The initial concept...

The final Problems and Benefits Hierarchy

REAL	IMAGINED	INTERMITTENT	PERSISTENT	LEGACY
PEDAGOGY / LEARNING DESIGN 28	LEARNING QUALITY 8	LEARNING QUALITY 5	PEDAGOGY / LEARNING DESIGN 13	SOCIETAL CHANGES 5
LEARNING QUALITY 21	STUDENT CENTRED LEARNING 8	STUDENT CENTRED LEARNING 5	LEARNING QUALITY 11	INSTITUTION SUPPORT 4
SOCIETAL CHANGES 17	PEDAGOGY / LEARNING DESIGN 7	CONVENIENCE / WORK LIFE BALANCE 4	STUDENT CENTRED LEARNING 10	LEARNING QUALITY 3
INSTITUTION SUPPORT 16	CONVENIENCE / WORK LIFE BALANCE 5	INSTITUTION SUPPORT 4	SOCIETAL CHANGES 10	PEDAGOGY / LEARNING DESIGN 2
STUDENT CENTRED LEARNING 16	INSTITUTION SUPPORT 4	SOCIETAL CHANGES 3	INSTITUTION SUPPORT 8	CONVENIENCE / WORK LIFE BALANCE 2
CONVENIENCE / WORK LIFE BALANCE 13	SOCIETAL CHANGES 3	PEDAGOGY / LEARNING DESIGN 1	CONVENIENCE / WORK LIFE BALANCE 7	STUDENT CENTRED LEARNING 2

YELLOW = Problems PINK = Benefits ORANGE = Both GREEN = Problems with 'ambivalence'
 Real - actual case studies, research evidence or expert knowledge
 Imagined - hearsay, assumption, anecdotal, conjecture
 Intermittent - partial, fragmented or non specific irregular issues
 Persistent - constant or nearly constant issues

Legacy - inherited issues, can be either real or imagined, persistent or intermittent
 The number of instances indicates lit data combined with RG2 and RG3 for contextual category occurrences. To arrive at a number for RG2 and RG3, context was analysed for each response category overall, presence of context was counted as 1.

INSTITUTION SUPPORT - Problem

SOCIETAL CHANGES - Problem
 PEDAGOGY / LEARNING DESIGN - Problem and Benefit
 CONVENIENCE / WORK LIFE BALANCE - Problem
 STUDENT CENTRED LEARNING - Problem with ambivalence
 LEARNING QUALITY - Problem with ambivalence

<http://webteach.penworks.net/maresearch/findings/3/>

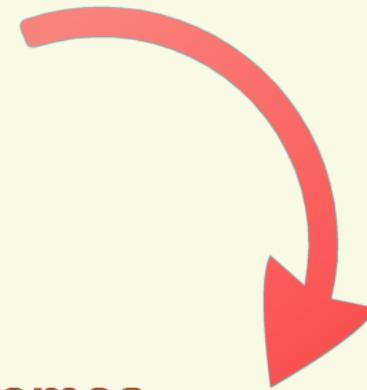
but how did I get here? 

Literature

Journal of Research in Science Teaching, 2010, 47(6), p. 651
A selection of up to 25 current papers and articles.
Books, journal articles and research papers were chosen from the following sources: Google Scholar, anything is older than 2007 (except Hayes, 2000, on usability) by reason of the exponential growth in
and availability of material online; anything published
in the last 10 years, as the number of users of the
Internet population was less than half what it is
today (Bartels et al., 2009); anything published in
China et al., 2008; and Smartphone penetration
has passed 2 billion users since the advent of
the iPhone in 2007. I try to double check the
Technology Analytics, 2012).

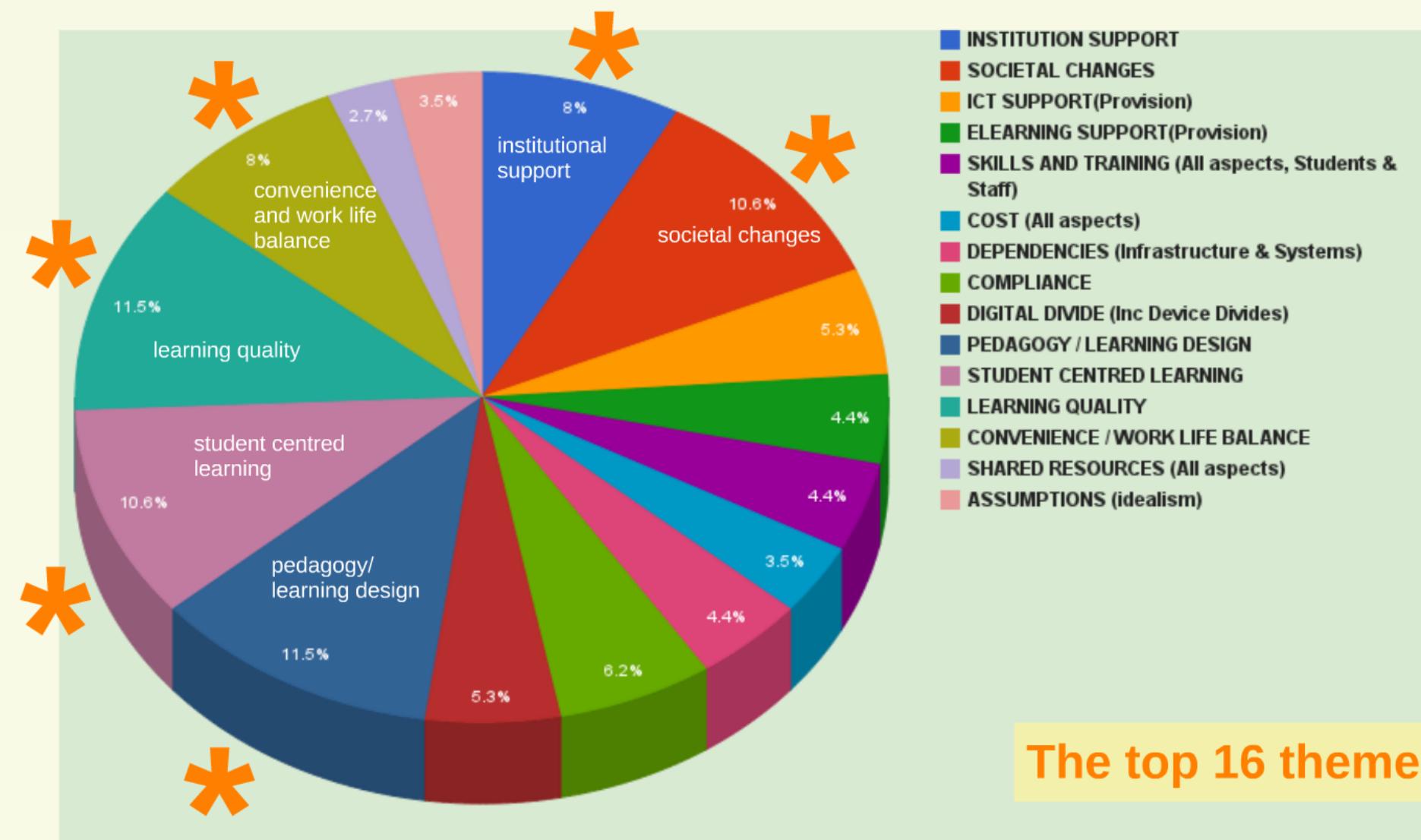
<http://webteach.penworks.net/maresearch/references/>

Up to date (>2007)
Not classroom based
Social/portfolio/web2...
Staff and student research



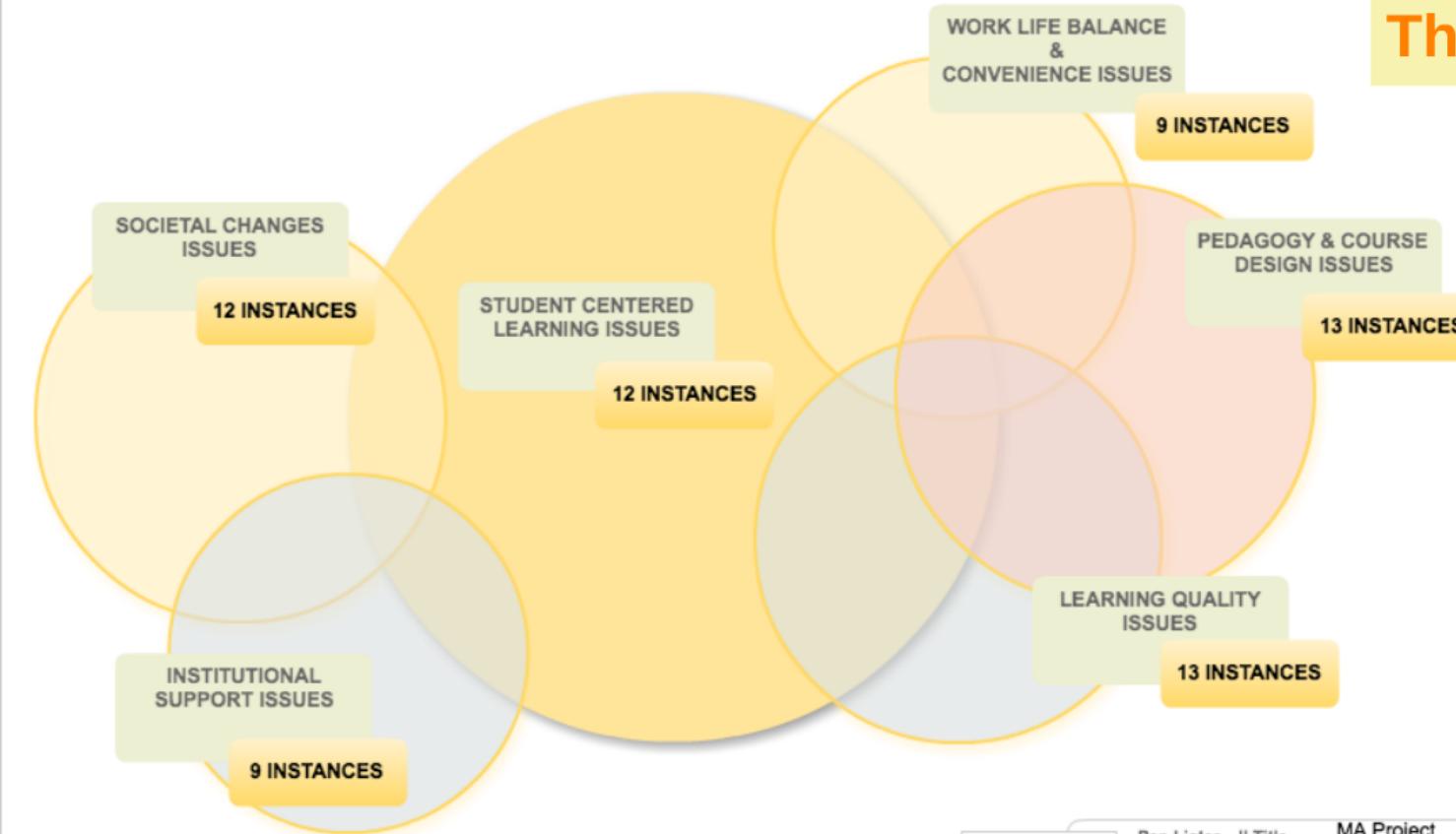
Note common themes
Code each source
Collate number of occurrences

*Around **10 books and reports** were used, plus a selection of up to **15 current papers** and articles. Books, journal articles and research papers were selected in part on the basis of their currency, and **nothing is older than 2007** (except Hayes, 2000, on usability) by reason of the exponential growth in use of technology since then. **In 2007 the world internet population was less than half what it is today**, and is set to double every 5.32 years (Guo-Qing et al, 2008), and **Smartphone penetration has topped 1 billion users since the advent of the iPhone in 2007**, and is set to double by 2015 (Strategy Analytics, 2012).*



The top 16 themes

The top 6 themes



Overlap between category labels is clear, showing the close relationship that influencing factors have on each other. However, the significance of one factor over another remains less clear. In simple terms, more research and discussion surrounds student centred learning than any other topic, in relation to the affordances which technology offers.

Perhaps, therefore, this provides some insight into the hierarchy of importance, or from which direction forward we can proceed, to greatest effect.

Contextual Categories

<http://webteach.penworks.net/maresearch/lit-analysis/#cat-theme-correlation>

1. Conjecture, speculation, assumption

2. Context association: *strength and frequency*

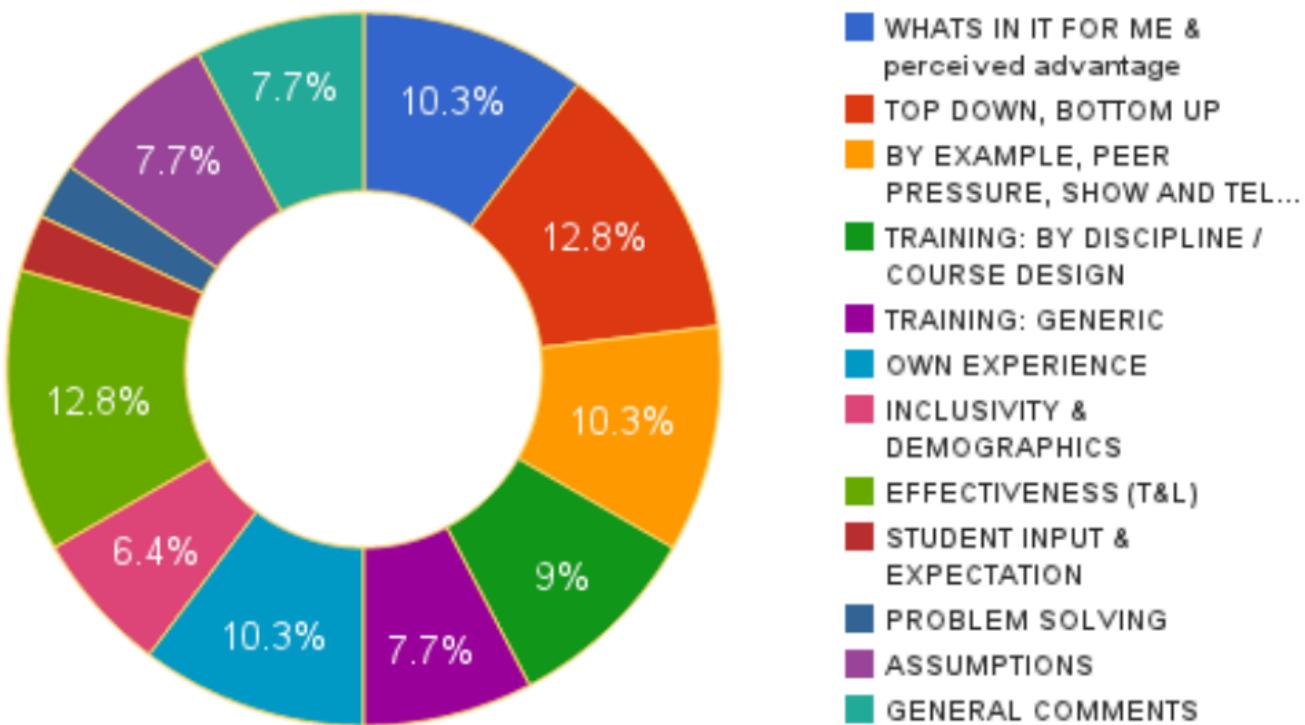
3. Evidence and expertise

4. Systems, change, the past

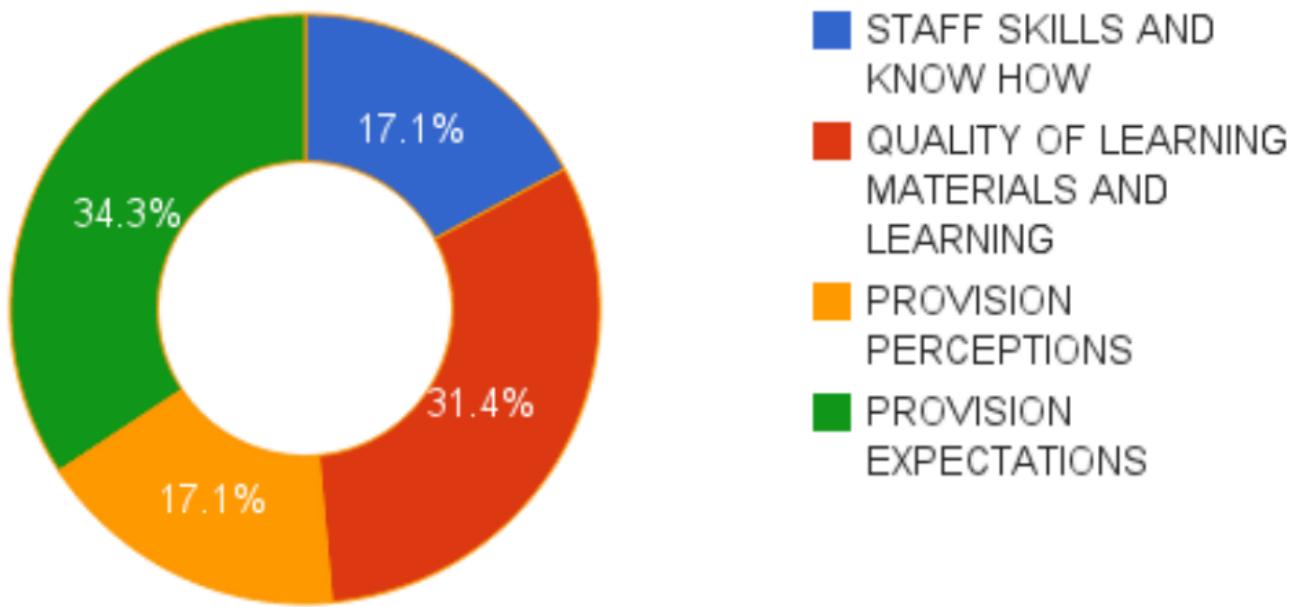
Contextual Scope	Types of context in scope (examples)	Description	PBH Factor
CONJECTURE, SPECULATION, ASSUMPTION	PA - Personal Assumption	<i>statement from a personal or individual standpoint with no evidence or expertise present</i>	
	DC - Data Conjecture	<i>statement being attributed to data which is not adequately evidenced</i>	[PBH:Imagined]
	HS - Hearsay	<i>statement attributed to 'everyone' or similar, which is only assumption</i>	
CONTEXT ASSOCIATION, STRENGTH AND FREQUENCY	IAL - Contextual interpretation/association low strength & frequency	<i>occurrence measurement of theme in research – low</i>	[PBH:Intermittent]
	IAH - Contextual interpretation/association high strength & frequency	<i>occurrence measurement of theme in research – high</i>	[PBH:Persistent]
EVIDENCE AND EXPERTISE	EK - Expert Knowledge	<i>statement made from deduction or logic using expert knowledge, but not directly connected to research evidence</i>	[PBH:Real]
	RE - Research Evidence	<i>statement made as a result of research evidence [PBH:Real]</i>	
SYSTEMS, CHANGE, THE PAST	P&C - Refers to the past or need for change	<i>statement about the past, or requirement for change in systems or central strategies, policies or provision</i>	[PBH:Legacy]

Table 3 showing key to terms for literature theme contextual categories and PBH allocation

RG2: Category Response Allocation (LinkedIn) & (ResearchGate)



RG3: Category Response Allocation (Students)



Interpreted and matched RG2 and RG3 data to the data from the Lit Review themes...

RG2: Context Category Presence to PBH for Top 6 Themes : Sheet1

LINKEDIN

Top 6 Themes	RG2 Response categories	REAL		IMAGINED		INTERMIT
		EK	RE	PA	DC	
INSTITUTION SUPPORT	Top Down/Bottom Up	X	X	X		X
SOCIETAL CHANGES	Student Input and expectations			X	X	
PEDAGOGY / LEARNING DESIGN	By example, peer pressure, show and tell					
	Others Experiences	X	X			
	Training by discipline	X	X	X		
CONVENIENCE / WORK LIFE BALANCE	Whats in it for me	X	X	X		X
	Problem Solving			X		
STUDENT CENTRED LEARNING	Student Input and expectations			X	X	
LEARNING QUALITY	Problem Solving			X		
	Effectiveness	X	X	X	X	

RESEARCHGATE

Top 6 Themes	RG2 Response categories	REAL		IMAGINED		INTERMIT
		EK	RE	PA	DC	
INSTITUTION SUPPORT	Top Down/Bottom Up	X		X		
SOCIETAL CHANGES	Student Input and expectations					
PEDAGOGY / LEARNING DESIGN	By example, peer pressure, show and tell					
	Others Experiences					
	Training by discipline					
CONVENIENCE / WORK LIFE BALANCE	Whats in it for me			X	X	
	Problem Solving					
STUDENT CENTRED LEARNING	Student Input and expectations					
LEARNING QUALITY	Problem Solving					
	Effectiveness			X	X	

RG2

Skills and Know How	Skills and Training	No	IAL-H, EK, HS	PROBLEM
	ICT and Elearning support	Yes		
Quality of Learning Materials & Learning	Learning Quality	Yes		EK, IAH, PA,HS
	Learning Design	Yes		
Provision Perceptions	Student Centred Learning	Yes		PROBLEM
	Institutional Support	Yes		
Provision Expectations	ICT and Elearning support	Yes	IAL, EK, PS	PROBLEM
	Student Centred Learning	Yes		
Provision Expectations	Institutional Support	Yes		BENEFIT
	ICT and Elearning support	Yes	P&C, IAH-L, EK	
	Student Centred Learning	Yes		

RG3

... and contextual categories

RG1

But what about the individuals?

The technical efficacy of staff in HE

Rogers
Diffusion of
Innovations
Innovator: Venturesome
Early Adopters: Respectable
Early Majority: Deliberate
Late Majority: Skeptical
Laggards: Traditional

6 question sets

Question Set 1

The first quick set of questions is to build up your technical profile on **how you use technology in your daily life**.

Set 1: Technology in your academic life

Question Set 2

The second set of questions is to build up an idea of **how technology is used amongst the staff in a university**.

Set 2: Technology amongst the staff population

Question Set 3

The third set of questions is to gather information on **how staff experience the technology provided by their institution**.

Set 3: Technology in your organisation

Question Set 4

The fourth set of questions relates to uses of **technology in teaching scenarios** – both directly, and underlying perceptions and associated services.

Set 4: Technology in teaching scenarios

Question Set 5

The fifth set of questions is all about **technology amongst the student population** and how you perceive the territory. Everyone has a valid opinion on this, not just teaching staff.

Set 5: Technology amongst the student population

Question Set 6

The sixth and final set of questions is about **technology and the future**, how your work and life could change because of technology. This set has 6 questions, the last being an open ended more detailed question*.

Set 6: Technology in your future work life balance

THE CHALLENGE

to record responses on topic areas AND to develop a system where the technical efficacy of each respondent could be matched to their topic responses

a by-product of this was an indicator (a scale) of their technical efficacy

RG1: Creating the RDI Indicator

- Number of devices
- Wide variety of operating systems
- High internet use
- High mobile use
- Amount of work or play ‘on the go’
- Wide variety of apps and software
- Strong enthusiasm for technology in all aspects of life
- Has ideas for uses of technology
- Speed of adaptation to new devices or applications
- Self efficacy accuracy ratio to actual skills and experience

1 innovator (R1)

2 early adopters (R3 and R7)

4 early majority (R4, R5, R6, R8)

1 late majority (R2)

RG1: RDI Indicator

USER/FACTOR	R1	R2	R3	R4	R5	R6	R7	R8
Number of devices	4+10	2+6	3+6	5+6	4+3	2+11	4+6	3+6
Wide variety of operating systems	HIGH	MED	MED	HIGH	MED	HIGH	HIGH	MED
High internet use (esp wifi)	HIGH	LOW	HIGH	HIGH	MED	MED	MED	HIGH
High mobile use	VERY HIGH	LOW	VERY HIGH	VERY HIGH	LOW	LOW	LOW	LOW
Amount of work or play 'on the go'	HIGH	LOW	HIGH	HIGH	MED	MED	LOW	MED
Wide variety of apps and software	HIGH	LOW	HIGH	MED	HIGH	MED	HIGH	MED
Strong enthusiasm for technology in all aspects of life	HIGH	LOW	MED	MED	MED	HIGH	HIGH	HIGH
Has ideas for uses of technology	HIGH	LOW	HIGH	MED	HIGH	MED	HIGH	MED
Speed of adaptation to new devices or applications	HIGH	LOW	HIGH	MED	HIGH	MED	HIGH	MED
Self efficacy accuracy ratio to actual skills and experience	ACCURATE	INNACURATE	ACCURATE	FAIRLY ACCURATE	FAIRLY ACCURATE	FAIRLY INNACURATE	FAIRLY INNACURATE	FAIRLY ACCURATE
RDI Indicator	INNOVATOR	LATE MAJORITY	EARLY ADOPTER	EARL MAJORITY	EARLY MAJORITY	EARLY MAJORITY	EARLY ADOPTER	EARLY MAJORITY

Quotes versus RDI relationship

Q: In your own words, how do you see the future of your role in academia, over the next 5 years, in relation to technology?

"My professional life is increasingly spent using technology. If the University network goes down, I don't know what to do as most, if not all, of my work involves use of the network. I don't see this trend slowing down..." R2

"I believe we will continue to work more virtually and communicate with stakeholders at more non standard times – some people may not embrace this and there is a balance to be made here – a real work life balance" R6

"It is essential to my role both now and in the future, I see it as increasing potential markets and revenue streams, as facilitating collaborative projects, as making admin processes and systems more efficient and accurate and as continually improving the learning and teaching experience" R7

**1 innovator (R1)
2 early adopters (R3 and R7)
4 early majority (R4, R5, R6, R8)
1 late majority (R2)**

Q: "The notion of technology enhancing learning is a false assumption, and the reality is very different."

(LIKERT, 1-5, where 5 strongly agrees)

1 = [R5,R6,R7]

2 = [R1]

3 = [R2,R3,R4]

4 = [R8]

5 = NONE

Challenges & Issues

The Research Approach

- How best to analyse multiple sets of data which together build a rich picture of information
- Use of mixed methods (*'Integrative Logic'*, Mason, 2006) in the context of an interpretivist critical realism paradigm (Oliver 2012)
- The project in part became a study of what worked and how to iterate these methods of analysis to best effect

Literature selection and analysis

- Literature selection criteria
- Interpretivist approach from critical realist perspective to develop category analysis
- Analysis of primary data models from RG2 & RG3 and Theme Occurrences
- More robust criteria for selection and analysis process in order to contribute more meaningfully to a theme hierarchy

Technology profiling

- Use of the technical profile data in relation to the core interpretation of a theme as a problem or a benefit
- Rogers Diffusion of Innovations and technical profiling to create an 'RDI' indicator

The Urban University: Implications

'Metropolitan' universities

- Diverse student bodies and learner differences in connection with technology enhanced learning
- Compliance: accessibility and the diverse student body
- Training provision with limited resources and a wide variety of academic staff

The Urban University: Implications

Significant relevance in a number of themes - especially in the top six. A variety of aspects all of core importance to the existence and purpose of metropolitan universities are present, including:

- Inclusivity
- Diversity
- Accessibility
- Learner Differences
- Equivalency
- Flexibility
- Student centered learning
- Student developed learning
- Personalised learning
- Work based learning

conclusions and recommendations

Institutional support together with learning design considerations are perhaps the most significant forces surrounding adoption of TEL, as drivers (when present) and restrainers (when absent)

The RDI indicator, along with primary stakeholder and literature data, contextually prioritised (such as in the Problems and Benefits Hierarchy developed here) might be used to deliver smart training to individual personalised requirements

conclusions and recommendations

The online support model used by Facebook and Google, emphasising the 'zero tolerance training' of those applications when introducing new functions or design changes whilst providing comprehensive online help information

Smart training delivery - one possibility being a shared sector-wide online system. This could work using 'smart TEL personalised data' similar to how Amazon knows which books you bought and might like to read next...

Final thoughts

By 2015 2 billion plus users on smartphone

Remote working will increase

Distance and blended learning will increase

**Technology is not for everything, but it probably
is for most things, some of the time**

Key Sources

Most influential theories and models

Use of mixed methods ('Integrative Logic', Mason, 2006)

Interpretivist critical realism paradigm (Oliver 2012)

Rogers Diffusion of Innovations

Lewin's Force Field Analysis

Full reference list including all literature review sources

<http://webteach.penworks.net/maresearch/references/>

