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?

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

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

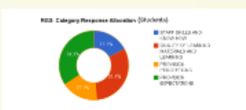
RG2 Academics in the "Teaching and Learning in Higher Education" LinkedIn group, with additional input from ResearchGate members, taking part in discussions around questions posed by the researcher. n=<20

RG3 Students taking part in discussions around questions posed by the researcher, using a 'secret' Facebook group. n=8

The initial concept...

The Final Problems and Benefits Hierarchy

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



Contextual Categories

1. Conjecture, speculation, assumption
2. Context association: strength and frequency
3. Evidence and expertise
4. Systems, change, the past

Literature

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

Note common themes
Code each source
Collate number of occurrences

But what about the individuals?
The technical efficacy of staff in HE

6 question sets

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

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

RG1: RDI Indicator

Challenges & Issues

The Research Approach

Literature selection and analysis

Technology profiling

Key Sources

Most influential theories and models

Full reference list including all literature review sources

Final thoughts

By 2015 2 billion plus users on smartphone
Remote working will increase
Distance and blended learning will increase

conclusions and recommendations

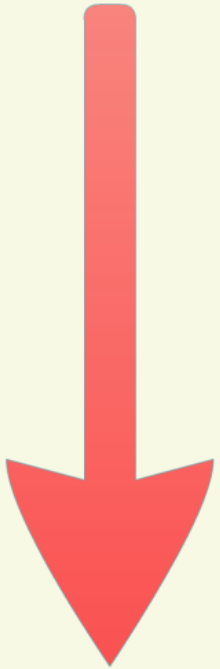
conclusions and recommendations

The Urban University: Implications

The Urban University: Implications

'Metropolitan' universities

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?

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MA Dissertation Research Title

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

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**'.

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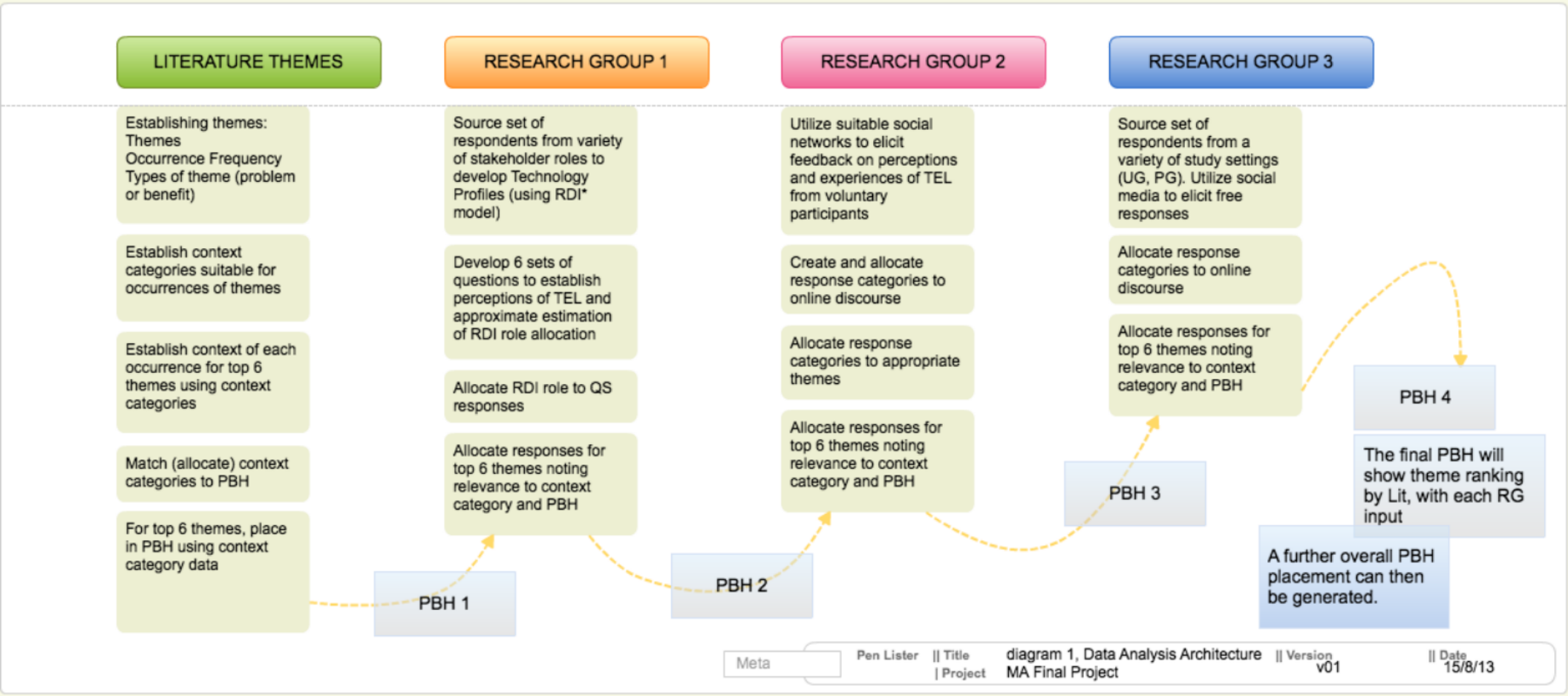
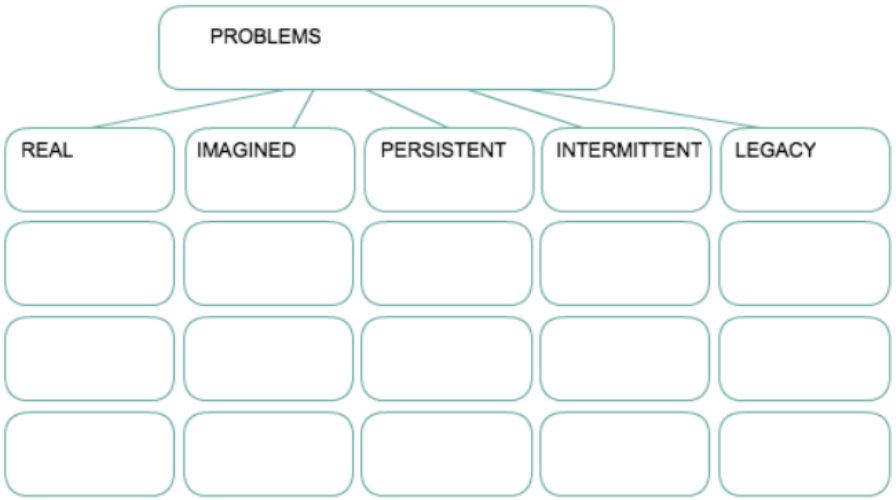
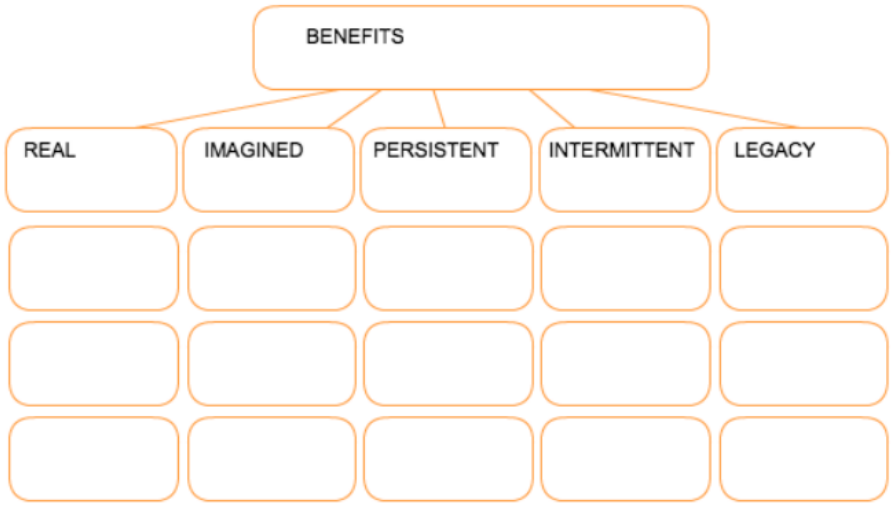
Contextual Cate



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...

Meta

Pen Lister || Title theme hierarchy || Version 0.01 || Date 17-5-13
| Project MA

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.

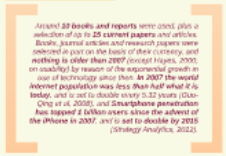
INSTITUTION SUPPORT - Problem
SOCIETAL CHANGES - Problem
PEDAGOGY / LEARNING DESIGN - Problem and Benefit
CONVENIENCE / WORK LIFE BALANCE - Problem
STUDENT CENTRED LEARNING - Problem with ambivalence
LEARNING QUALITY - Problem with ambivalence

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

but how did I get here?

Literature

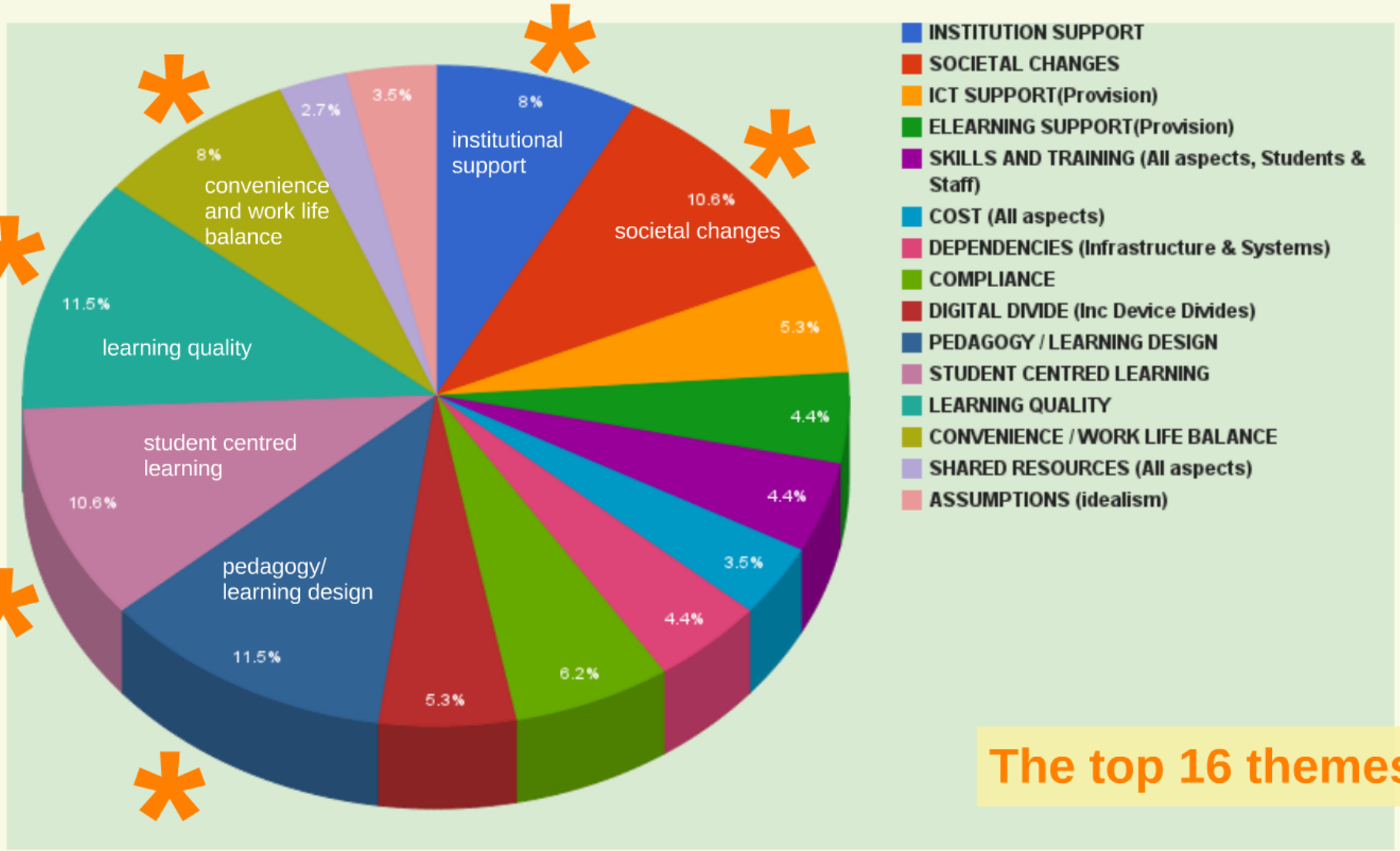
Up to date (>2007)
Not classroom based
Social/portfolio/web2...
Staff and student research


Around **10 books and reports** were used, plus a selection of up to **25 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 (Qua-Ong 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).

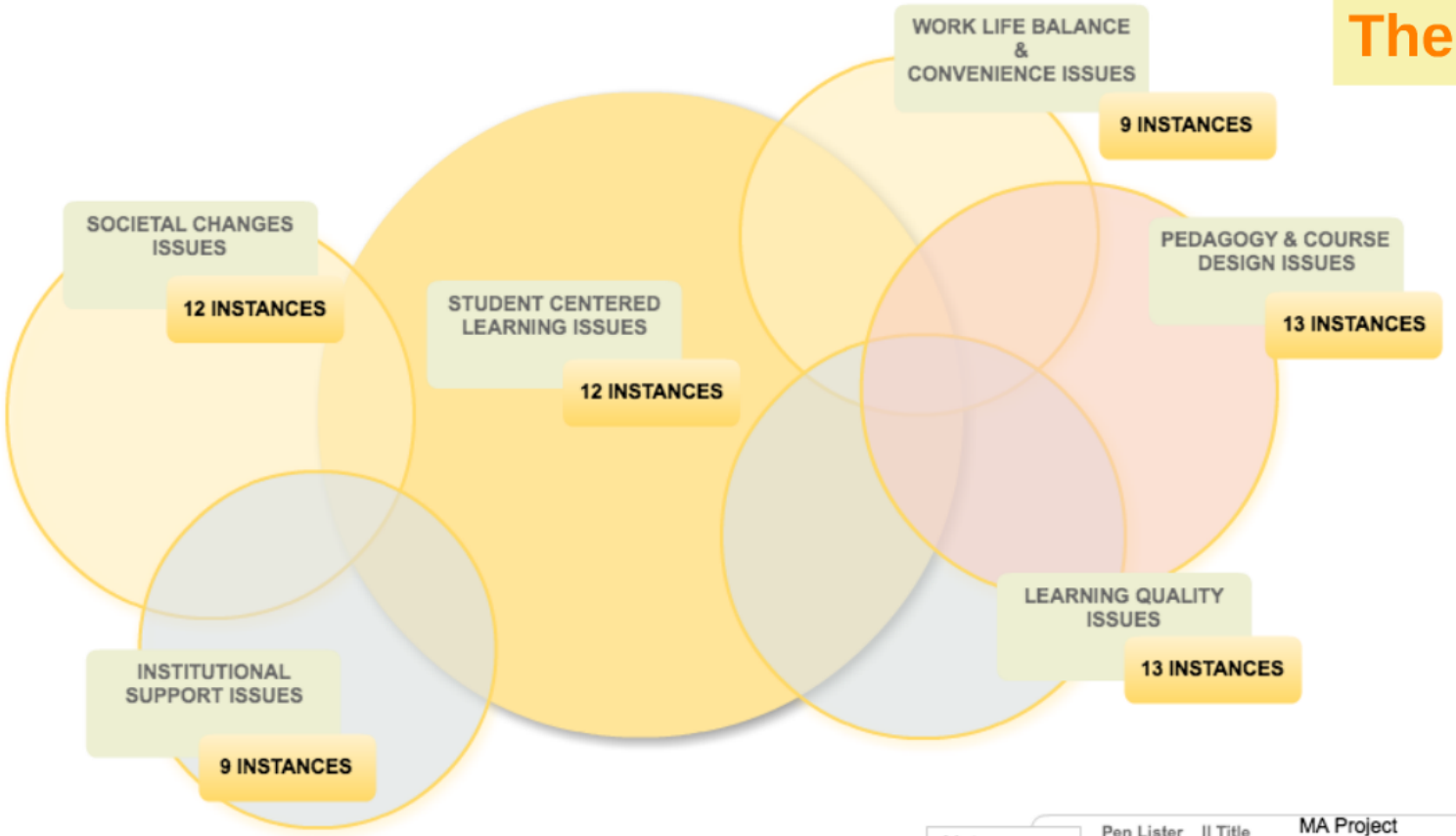
Note common themes
Code each source
Collate number of occurrences

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

*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.

Meta

Pen Lister || Title | Project: MA Project Venn Dia of primary associations || Version || Date

Contextual Categories

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

1. Conjecture, speculation, assumption

2. Context association:
strength and frequency

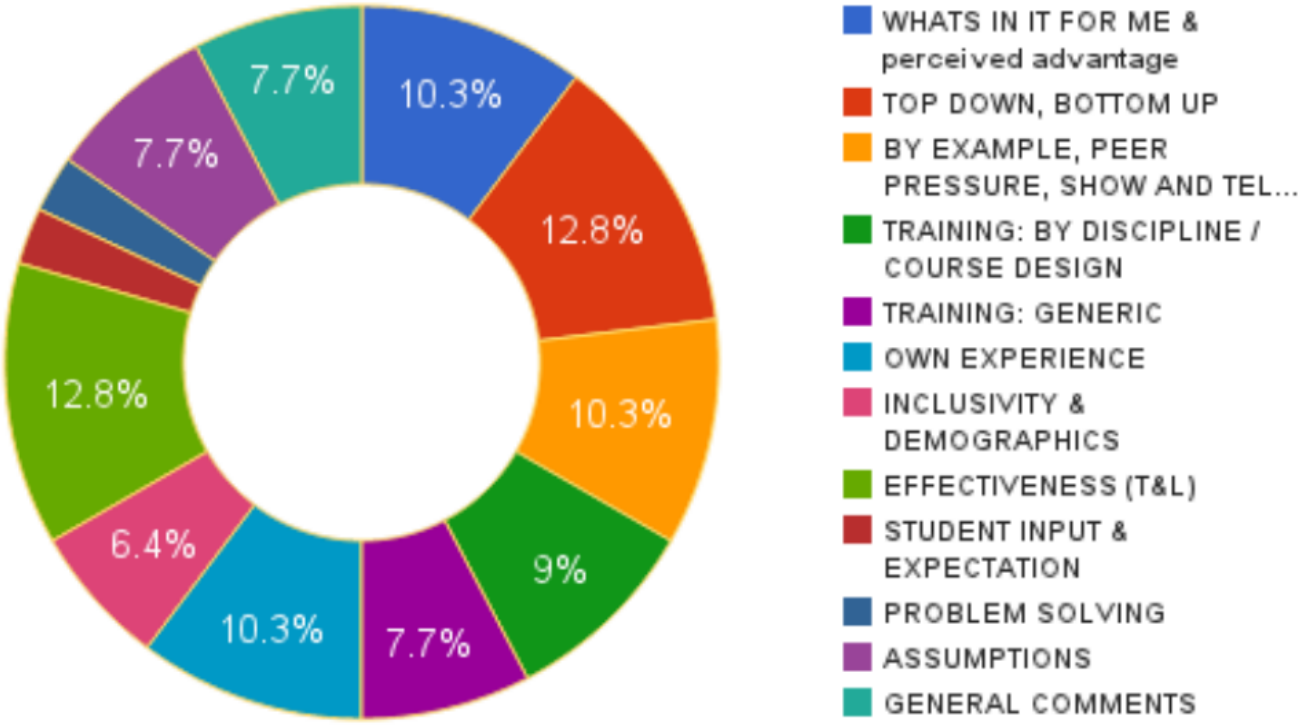
3. Evidence and expertise

4. Systems, change, the past

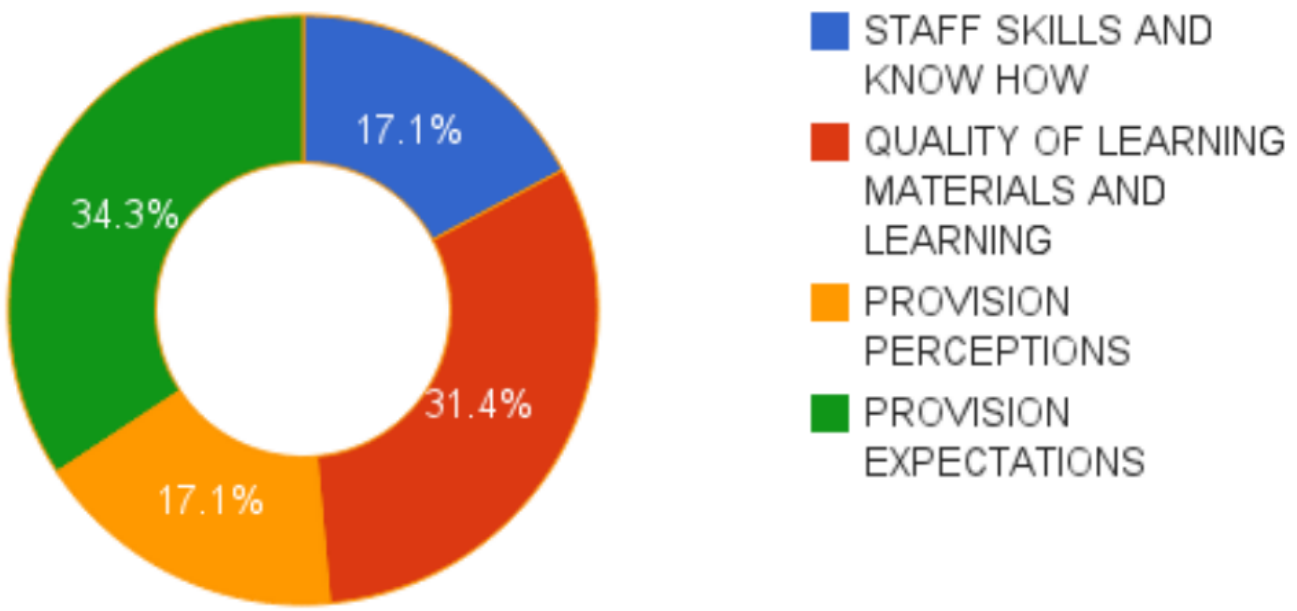
Contextual Scope	*Types of context in scope (examples)*	*Description*	*PBH Factor*
CONJECTURE, SPECULATION, ASSUMPTION	PA - Personal Assumption	*statement from a personal or individual standpoint with no evidence or expertise present*	[PBH:Imagined]
	DC - Data Conjecture	*statement being attributed to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

RESEARCHGATE

Top 6 Themes	RG2 Response categories	REAL		IMAGINED			INTERMI
		EK	RE	PA	DC	HS	IAL
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 LEARNING QUALITY	Student Input and expectations						
	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	PROBLEM
	Learning Design	Yes		
	Student Centred Learning	Yes		
Provision Perceptions	Institutional Support	Yes	IAL, EK, PS	PROBLEM
	ICT and Elearning support	Yes		
	Student Centred Learning	Yes		
Provision Expectations	Institutional Support	Yes	P&C, IAH-L, EK	BENEFIT
	ICT and Elearning support	Yes		
	Student Centred Learning	Yes		

RG3

... and contextual categories

But what about the individuals?

The technical efficacy of staff in HE

RG1

Rogers Diffusion of Innovations

Innovator: Venturesome
Early Adopters: Respectable
Early Majority: Deliberate
Late Majority: Skeptical
Laggards: Traditional

6 question sets

RG1

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

http://webteach.penworks.net/maresearch/appendices/technical-profiles-questions/

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 INNACCURATE*	*FAIRLY INNACCURATE*	*FAIRLY ACCURATE*
RDI Indicator	INNOVATOR	LATE MAJORITY	EARLY ADOPTER	EARL MAJORITY	EARLY MAJORITY	EARLY MAJORITY	EARLY ADOPTER	EARLY MAJORITY

Quotes versus RDI relationship

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

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

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**

learning and teaching experience" R7

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

http://webteach.penworks.net/maresearch/appendices/technical-profiles-questions/

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/


Q&A