Digitial Literacy and Blended Learning
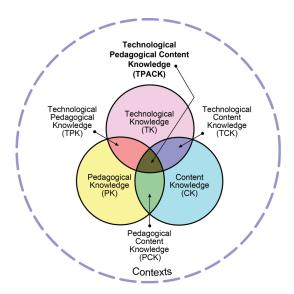
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Background

- The relationship between digital skills, pedagogical understanding and student success is by no means straightforward and at present under-researched, certainly in UHI. It seems particularly relevant for the UHI to explore the relationship between these factors as the unique set up (delivering a range of course across a vast geographical area) means that staff are continuously required to utilise digital technologies in a manner they may not have been trained or indeed prepared for in terms of subject expertise.

- Previous research found frustration from both staff and students at the lack of time to explore the full functionality of the VLE and access to services and training are major issues for almost all. These results were discussed in relation to the TAM model which suggests that perceived ease of use, rather than perceived usefulness is the main factor driving overall satisfaction and actual use (Clayes et al, 2017).

- Previous report has highlighted that most staff were unaware of the learning standards designed to ensure standardization across the institution.
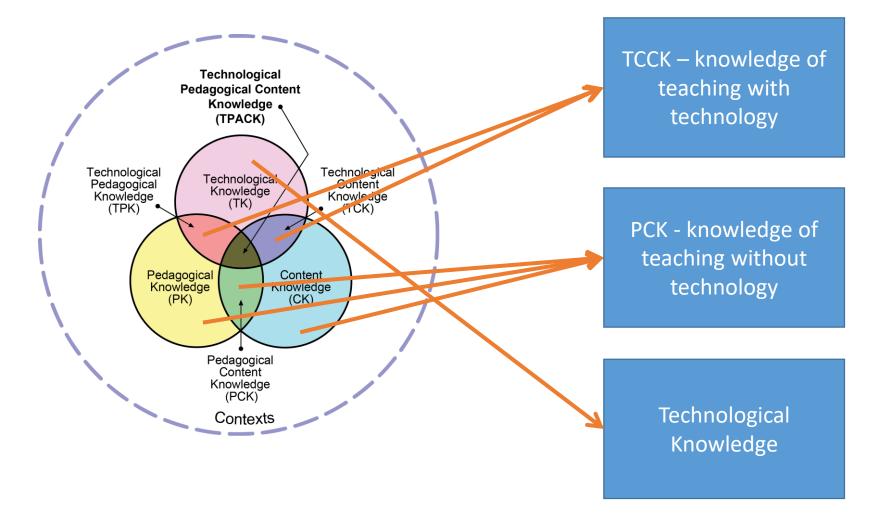
Background

- One of the barriers staff identify in using the virtual learning environment relates to training, one that encompasses the technical how-to training and covers training on how to effectively use learning technologies.

- Previous research has shown that a successful integration of ICT in education follows from a strategy that aligns technology use with pedagogical approach (Mishra and Koehler 2006; Rienties et al. 2013).

- Meadows and Henry (2008) notes that "because the online world is a categorically different environment, a particular blend of skills and knowledge is necessary (p. 6)." In order to provide an effective training programme on for lecturers, it is thus important to have an assessment of the current scenario.

- By examining lecturer's digital skills and mapping this on to knowledge of learning standards, we hoped to gain a more detailed picture of staff abilities and understanding that could be used to inform future training policies.

TPACK (Technological, Pedagogical and Content Knowledge) Model

- **content knowledge (CK)**
knowledge of the subject area;

- **pedagogical knowledge (PK)**
knowledge of teaching practices;

- **technological knowledge (TK)**
knowledge of various technology;

- **pedagogical content knowledge (PCK)**
overlap between content knowledge and pedagogical knowledge;

- **technological content knowledge (TCK)**
knowledge of how technology can be integrated to facilitate learning;

- **technological pedagogical knowledge (TPK)**
knowledge of how teaching changes as a result of using various technologies.

TPACK Model

TCCK – knowledge of teaching with technology

PCK - knowledge of teaching without technology

Technological Knowledge

Archambault and Barnett's (2010) 3 Factor Model

Research aims

- Assess staff digital literacy and skills in embedding technologies for learning and teaching

- Investigate the relationship between staff technological and pedagogical skills using the TPACK model.

- Investigate staff understanding of blended learning standards.

- Investigate how staff update and develop their knowledge on learning technologies.

- Investigate how the institution supports staff in improving their skills in using learning technologies

Method

- A mixed method survey design was used to gather opinions of UHI staff regarding digitial literacy and blended learning.

- Ethical permission was sought prior to the start of the survey. Consent was also sought from the developers of the TPACK instrument.

- The survey was administered using Bristol online survey and participants completed the survey within the first six weeks of the semester.

- A total of 112 lecturers participated in the survey.
  - Fifty-eight of the respondents (52%) were teaching HE only modules while the rest (n=54; 48%) had dual roles both as a further and higher education lecturer.
  - Sixty-five of the lecturers (59%) were from the arts, humanities and social science background while the rest (n=45; 41%) were from the science and engineering disciplines.
  - Sixty-one of the lecturers (55.5%) were employed full-time while the other lecturers were on part-time employment contracts (n=49; 44.5%).

Survey

- The survey consisted of nineteen questions (several open ended) relating to digital literacy and blended learning including demographic questions.

- The survey was divided into three parts
    1. TPACK inventory
    2. design of online learning
    3. relevant training

- TPACK: Lecturers rated their ability in doing a variety of tasks related to TPACK using a 5-point Likert scale (Archambault and Barnett, 2010).

- The blended learning inventory was designed as a likert-type survey (never, sometimes, always) using the relevant items from the university's blended learning standards.
    - Sample questions are:
        - My course provides opportunity for feedback.
        - I provide a comprehensive module information, which includes the module description; learning outcomes, schedule of work and reading lists.

Method

- Semi structured interviews (7 face to face and 4 via email) were also held

- Sample questions include

  - Provide an example of how you used technology for L&T.

  - How do you apply the blended learning standards to your practice?

  - How do you update your skills in using learning technologies?

Results: TPACK

TPACK item and subscales	Mean	SD
Pedagogical content knowledge (PCK)	3.67	0.71
My ability to comfortably produce lesson plans with an appreciation for the topic.	4.02	0.87
My ability to use a variety of teaching strategies to relate various concepts to students.	3.66	0.86
Technological curricular-content knowledge (TCCK)	3.11	0.84
My ability to implement the curriculum in an online environment.	3.43	1.05
My ability to implement different methods of teaching with technology.	3.22	1.01
Technical knowledge (TK)	2.58	1.14
My ability to address various computer issues related to software (e.g., downloading appropriate plug-ins, installing programs	2.71	1.28
My ability to assist students with troubleshooting technical problems with their personal computers.	2.56	1.2

TPACK Results

Dependent Variable	Faculty	HEA Membership	Mean
PCK	Arts, Humanities and Business	No	3.386
		Yes	3.903
	Science, Health and Engineering	No	3.320
		Yes	4.220
TCCK	Arts, Humanities and Business	No	2.610
		Yes	3.304
	Science, Health and Engineering	No	2.760
		Yes	3.700
TK	Arts, Humanities and Business	No	2.190
		Yes	2.623
	Science, Health and Engineering	No	2.295
		Yes	2.567

TPACK Results

		TPACK subscales			MANOVA	
		PCK	TCCK	TK	F	p-value
Nature of employment	Full-time	3.88 (0.64)	3.28 (0.76)	2.52 (1.16)	7.619	.000
	Part-time	3.36 (0.64)	2.78 (0.75)	2.53 (1.05)		
Training	Training	3.72 (0.65)	3.03 (0.81)	2.34 (1.16)	.896	.446
	No training	3.62 (0.72)	3.09 (0.82)	2.63 (1.07)		

TPACK Results

	PCK	TCCK	TK	Int
PCK	1.00	.657**	.167	.210*
TCCK		1	.594**	.314**
TK			1	.211*
Interactivity (low, high)				1

Conole's Taxonomy of Elearning Task

Low-level interactivity (assimilative and communicative tasks, for example, use of word/PDF documents concurrent with the use of discussion board).

High level interactivity - responses that combine the use of assimilative, communicative and productive tasks (synchronous and asynchronous communication tools, interactive quizzes and online activities)

Research aims

Assess staff digital literacy and skills in embedding technologies for learning and teaching

Investigate the relationship between staff technological and pedagogical skills using the TPACK model.

Results

Q15- Can you briefly discuss your understanding of blended learning?

Coding for survey responses – number who responded from a total of 99

Combining online and face to face instruction	42
Combining instructional modalities (or delivery media) – *Practice used to improve student engagement. It involved providing diverse presentation, and experiences of the content so that students use different senses and different skills during a single lesson*	*22.*
Combining instructional methods – *methods used by teachers to enable students to learn. Determined by subject matter to be taught and by the nature of the learner*	*26.*
Don't know/Miscellaneous	*9.*

In line with existing literature almost half responded that blended learning was a mixture of face to face and online instruction, with the remaining half divided as to whether it was defined by mode of learning or method.

UHI definition of blended learning

- A considered approach that selects from a range of traditional face-to-face methods and e-**learning** technologies to facilitate student engagement, develop independent **learners** and enhance the **learning** experience

- Simco and Campbell, 2011

Results

Q16- What skills do you think are essential to effectively deliver a blended learning course?

IT Skills	19
Subject matter	*5*
Pedagogy	*8*
Combination (IT, subject matter and/or pedagogy)	*47*
Miscellaneous (e.g. motivation,flexibility,organization)	*19*

Examples

Flexibility, the ability to adapt and deploy different strategies, problem solving (aka initiative), and familiarity with the technology being used. And very importantly, the ability to recognise students' limitations and anxieties around unfamiliar technology.	Pedagogy, IT skills
Ability to offer a balance between collaborative activities in the room and opportunities for student-directed learning using online resources and prompts. Better skills for trouble-shooting technology than I currently have.	Pedagogy, IT skills

Results- Blended learning standards and practice

- Question 11

- Only 41% of staff aware of blended learning standards document, only 25% have used the document in practice and of these 61% found it somewhat useful.

- Question 12 required lecturers to reflect on their own module delivery and consider how often they implemented standards such as clear guidance, structured activities, IT information at induction, essential module information, study skills information, copyright and plagiarism, relevant contact details and opportunities for interaction with other students and feedback (always, sometimes, never).

- More than 60% of lecturers responded 'all the time' with less than 5% responding 'never' to 13 of the 16 learning standards. Interestingly, the questions where less than 60% responded all the time were relating to contingency plans if the technology were to fail, monitoring at risk students and netiquette guidance.

	Never	Some -times	All the time
My course provides opportunity for feedback	0.9%	9.2%	89.9%
The activities and content are designed to meet the learning outcomes and objectives	0.9%	10.0%	89.1%
The individual activities I use are clearly structured and relate to the overall purpose of the course	0.9%	13.6%	85.5%
My course provides opportunity for interaction with other students	1.9%	23.1%	75.0%
My course includes a variety of activities to meet different learning styles	1.8%	23.9%	74.3%
Appropriate processes are in place to keep students on track.	0.9%	30.3%	68.8%
I provide students with information on study skills	4.6%	30.3%	65.1%
I provide a comprehensive module information, which includes the module description; learning outcomes, schedule of work and reading lists.	2.8%	10.1%	87.2%
Relevant contact details for support (technical; personal academic tutor, student support) are provided	6.4%	15.6%	78.0%
I provide students with information on copyright and plagiarism	5.5%	17.4%	77.1%
My course module is clear and easily navigated.	0.9%	22.2%	76.9%
At induction, students are made aware of the technical skills required and support materials are provided to meet these requirements	7.4%	24.1%	68.5%
I provide clear guidance to students on how to navigate/use the online module	3.7%	34.9%	61.5%
I provide an etiquette/netiquette guidance to students	22.4%	22.4%	55.2%
I use monitoring tools to identify 'at risk' students	13.0%	38.9%	48.1%
There are contingency plans in place in case technology equipment fails	6.4%	57.3%	36.4%

Results

Investigate staff understanding of blended learning standards.

- Most define blended learning as online and face-to-face instruction
- In terms of skills required for blended learning overwhelming response was IT skills (combination of IT and pedagogy/subject matter) and interesting so few mentioned subject matter alone.
- Very few staff aware of blended learning standards yet most implement these in their design of learning environments.

Results

Investigate how staff update and develop their knowledge on learning technologies.	Investigate how the institution supports staff in improving their skills in using learning technologies

- Interview data

- Most lecturers positively responded to the integration of IT in their practice and detailed the broad range of technologies that they employ. The majority of respondents used the institutional Blackboard VLE in order to achieve this.

- The level of innovation and the variety of asynchronous and synchronous technologies used was rich. External technologies included the use of YouTube and iMovie. This shows how lecturers have undertaken independent training and development of technologies out with the VLE to heighten student engagement.

- It is however important to note here that lecturers participating in the research may have volunteered due to their wealth of IT knowledge and experience.

- *"A large proportion of my skills are self-taught. I will spend my time familiarising myself with technology and will engage in workshops and tutorials to help further develop my skills".*

- *"I would appreciate specific training workshops"*

- *"It would be useful to have a go to person to ask for particular, specific training or one off queries. Often this works better when you are actually trying to use a particular tool rather than long workshops".*

- *"Occasionally attending a formal CPD session but usually informally by asking colleagues to demonstrate how to use different learning technologies".*

Results

- The need for formal training opportunities delivered by the institution is still important in facilitating networking opportunities. The absence of formal training was a common concern given the forthcoming introduction of a new VLE to the institution. This suggests that practitioners feared there would be no existing expertise to informally tap into or that there would be an assumption of capability.

- *"I am concerned that the level of training provided for the new VLE will assume that all staff using are competent. This is not the case for every lecturer; there has been no benchmark expectation, current training programme or induction for staff".*

- *"…lots of support available, the time to take up the support is not".*

- *"CPD sessions are offered however due to time constraints I rarely am able to attend"*

- *"I would also like some more examples of good practice to help with designing online activities and better use of tools".*
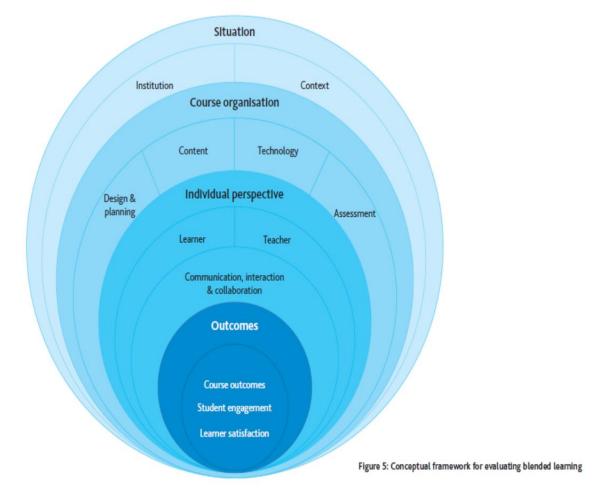
Results summary (blended learning)

- Overall these results suggest that staff consider blended learning to be a mixture of face to face and online teaching, yet tend to emphasise the importance of IT skills over pedagogy when considering how blended learning differs from face to face.

- While many seem unaware of institution standards they are nevertheless implementing these standards in their own design of learning environments.

- From the interviews it appears that staff are well aware of the problems surrounding blended learning and how they work on strategies to solve these such as induction programmes and effective communication. They also seem to spend a lot of time and effort updating IT skills and many would appreciate more formal support in this area.

- Interestingly while only 41% of staff were aware of the institution standards regarding blended learning, 78% stated that they would appreciate guidelines on how to implement blended learning into their teaching. Perhaps these findings can be understood in light of the interview responses as it appears that staff require more examples of best practice, named persons they can contact in person and perhaps more informal, general and even local support to help them adhere to standards.

Discussion

- Debate regarding definition of 'blended learning', confusion in literature mirrored in results- mode, method or simply face to face and online? Emphasis on IT skills over pedagogy and subject matter

- We found that those with higher TPACK scores tend to apply more interactive learning designs into their modules. We investigated how TPACK varies by subject area, employment status, training attendance and HEA status and found nature of employment and HEA status to be moderating factors .

- These two variables are indirectly related to years of teaching experience which we haven't accounted for in our design so it would be worthwhile looking into this further.

- Being able to know the TPACK profile of lecturers can facilitate design of training that would support the development of staff competencies. In our study, we found TK scores of lecturers is lower overall but their PCK scores and TPK scores were higher. This was regardless of the demographic factors investigated. It is thus important to offer technology training that will help align their TK scores with PCK and TCCK.

- Support to align TPACK of part-time lecturers and those who transition into teaching is also needed to bridge the skills gap.

- The TPACK instrument is useful for both staff and institutions when considering the relevant skills required for learning and teaching, and what factors may influence them.

Bowyer and Chambers, 2017.

Figure 5: Conceptual framework for evaluating blended learning

Thank you for your time

Questions