Teaching Technologies in FE - an issue of capability creating capacity – based on innovative research carried out at Thanet College staff as a means of assessing capacity and capability in confronting new technologies.

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This work used an innovative method of assessing capability of staff to use a range of new technologies and was used to decide an order and approach to introducing new technologies to the College.

Introduction

In recent years, there have been growing international concerns to evaluate the use of technology in post-compulsory education and other components of national education systems; growing out of the concern of governments and other funding bodies to evaluate the return on investment in technology in education seen since the mid 1980's. One result of this concern has been the development of models for evaluation of the use of technology in individual institutions and the creation or development of some national and international benchmarks, most commonly in the higher education sector. In this wider context there has been a growing use of the term e-maturity. At Eminent 2007, Balanskat¹, set out this broader context across the education systems of European states. E-confidence describes the use made of technology in education, and there has been the development of a number of self-assessment models making use of this concept e.g. Marshall and Mitchell² in New Zealand and Australia, Bacsich³, and other workers, in the UK.

The term 'e-maturity' has attracted considerable criticism recently as an inadequate way of defining the search for a measurement of capability and capacity. However the preferred term 'e-confidence is used in this Paper as it will be argued that this more accurately reflects what is desired by way of staff development. There is also an emerging differentiation centred on e-enablement between approaches that are focussed on organisational development perspectives derived from a managerial perspective and capacity building approaches concerned with staff skills. As will be apparent from the paper, the authors believe that a more synthetic approach to the issues discussed will provide means to resolve the issues that arise when leadership and staff skills are seen as being different contexts.

At a national level in England there has been the development of an e-confidence model for the further education sector in England by Becta. (Becta is the national agency responsible for the development and implementation of the Government's estrategy for education – Harnessing Technology) The Becta model, and others have been markedly influenced by the MIT Maturity model and related work that was originally focussed on software development and engineering. Similar work has been undertaken with colleges in Scotland and Wales. For higher education institutions (HEIs), there has been work commissioned by the HE Academy (HEA). The work in Scotland was based on the eMM model developed by Marshall and Mitchell⁴.

The concept of e-confidence arising from these different activities is being used as a means of expressing/quantifying the extent to which organisations, within the education system with in the UK use technology effectively to support learning, teaching and other business processes, including management. Becta's tool Generator has provided a well received method of quantifying e-enablement through benchmarking, and it is arguable that the Technology Exemplar Network (TEN) encourages e-confidence amongst practitioners by sharing innovative practice.

This paper explores the way in which the experience of a project working with Becta's developing model of e-confidence has influenced a college's emerging view of its responses to changes in curriculum, workforce development and a wider understanding of learning and learners.

Thanet College is a general FE college situated in and serving the population of East Kent. The college employs 460 staff, of which 140 directly teach or provide support up to 7000 learners, most of whom are work based learners, learn part-time or attend college in the evening. A widely used definition of e-confidence is that used by Becta (2006)⁵ "Institutional e-confidence (sometimes described as 'e-enablement') is the capacity of a college or learning institution to make strategic and effective use of technology to improve educational outcomes"). This definition has been used in this paper, although there are other definitions and concepts used in the post-compulsory sector such as those embedded in the e-Learning Positioning Tool (ELPT)⁶ developed by NIACE for providers in adult and community education, Extensive work in this context has also been carried out by the JISC (Joint Information Systems Committee); drawing on statements in the e-strategies from Higher Education Funding Council for England (HEFCE)⁷, Higher Education Funding Council for Wales (HEFCW)⁸ and Embedding Learning Technologies Institutionally (ELTI)⁹. Other work by Becta is deriving a system level view of e-confidence for the sector by utilising data from its annual surveys of FE colleges, adult and community learning, workbased learning and offender learning, and this work will be further developed between 2009 and 2011¹⁰. Meeting the challenges identified in this work is the anvil on which e-confidence is tested; the ability to cope with the new, the unexpected and to some degree, unknown.

We have used the Becta definition in this paper as it is used widely in discussions of e-confidence within the United Kingdom and it is embedded in the current e-Strategy for Education (Harnessing Technology: Next generation Learning 2008-2014)¹¹ and used in the Self Review Framework for schools (SRF)¹² for schools with approximately 20,000 users in the UK.

With the then subsequent rise of Web 2.0 generation, college staff have been witness to the extensive use of technology and associated behaviours amongst students and young teachers, many of whom routinely use social networking as an everyday adjunct to their lives. Three key documents in a growing literature on this issue are The JISC reports on their "Learner experiences of e-learning project" and "In their own words" and the Becta survey of learners in FE colleges 15. It is now widely appreciated in the sector, that whilst having equipment and networks is important it is the change in approach to utilising technology and the resultant changes that brings to the working practices, that enables practitioners to get the most from equipment that is the most important factor 16. In other words, the issue for

providers is the ability to adapt and change practitioner behaviour and the sophistication of that adaptation - that is, as human potential or capability of the staff - linked to the capacity of the College in terms of hardware, software and networks that more fully describes organisational e-maturity. As will be noted later in this paper, the project progressed by incorporating the developing concern around the college's capability and what was meant by the term organisational capability. This became another focus for the authors' considerations. This additional aspect of the project reflects the extensive debates around this topic in Australia e.g. the work of the National Council for Vocational Education Research cited below and the further development work on e-confidence that has resulted in the recent launch of Becta's "Generator" tool with its concern for business processes in provider institutions in the further education sector in England. This tool has been designed and marketed as a leadership tool, where our focus has been primarily on learning and teaching in this paper.

Rationale

All of this activity takes place at a time of convergence of 4 developments and this Paper reflects on we can bring together coherently the development of staff in elearning to best meet and exploit the convergence.

The 4 themes are:

- 1. The pace of change:
 - The rapid broadening and diversification of technology that needs to be understood as it affects purposeful pedagogy.
- 2. Technology as a servant of learning:
 - A desire to let technology uses and development follow the needs of the teacher and learner in whatever organisational relationship it finds itself. In other words there is not one model of approach technology must follow where purposeful and effective pedagogy leads.
- 3. Technology as the norm:
 - A rising expectation from learners that technology will become central and normal to the learning experience offered and the experience will be uniquely tailored to their needs
- 4. Rise of the reflective teacher:
 - The need for teachers to employ reflection as a mechanism to narrate development and the emergence of new technologies in the shape of reflective portfolios to accommodate this.

This study attempts to assess organisational e-confidence in a medium sized FE college and whether it can be measured so that the capacity of the organisation (what it has by way of equipment, systems, staff skills, etc.) can be considered in the context of a measurement of staff capability i.e. the capacity to change, and adapt quickly to the growing range of technology available to learners both through the college and in their own lives. Capability includes the desire, in terms of both policy and practice, of providers, to exploit all the potential technology can bring, to changing how and when a College invests effort in meeting its purposes, principally learning and teaching.

To press the maturity analogy further, to gauge behavioural change requires an investigation of the College's collective state of mind i.e. what are we doing with technology, rather than the physical characteristics (capacity) although both are relevant to the assessment of e-confidence as defined by Becta. This is itself influenced by the College culture, changes to curriculum delivery, accommodation of more personalised journeys of working and learning and the capacity to absorb rapid changes in a world of rapidly broadening horizon of possibilities and , of course, recent College training and influences from home and immediate colleagues.

10 years ago, colleges collected data on what equipment was available. The early stages of the Becta annual survey of the use of technology in colleges is an indicator of this approach.¹⁷ Then we measured the capacity of staff to use it by auditing formal success in national awards such as CLAIT and ECDL. Questionnaires would ask for assessments of skill in using a limited suite of (business) software packages, which had little value for learning and teaching and rather more in terms of describing whether staff could respond to the administrative and management roles of their jobs. In order to pursue these ideas further the following hypotheses were developed in order to clarify the scope and purpose of our analysis.

Hypotheses

In order to take this work and analysis further, we have made the following assumptions:

- people do not make changes unless the desire to do so has a personal component, (sometimes described as intrinsic motivation) so adaption does not happen without motivation to change and explore and the creation of contexts that make such changes and explorations relatively safe i.e. when the consequences of not changing may have more negative consequences than making changes.
- 2. There is an explosion of ways in which technology can be used positively in learning and teaching and there are as many ways to using at it as there are staff engaged in the process. The key for organisational development is to engage staff in making changes rather than responding to rigid controls implemented through managerial imperative or rigid procedures.
- 3. With this explosion of methods and application of curriculum knowledge to teaching, the appropriate focus now emphasises learning as the most important process in classrooms and at organisational level, in short, learning may well be better caught than taught.

Consequently, our notion of motivation in this context is focussed on intrinsic factors. The driver of change, coupled with technological possibilities requires us to consider a measurement of feelings and emotional reaction to ways of using technology in order to estimate e-confidence and move away from approaches based on assessing a limited range of skills and outcomes of the use of business software e.g. CLAIT, towards professional development models derived from the development and use of professional standards such as those developed by Lifelong Learning UK (LLUK) and the influence of the new professional body for the sector, the Institute for Learning (IfL) responsible for assessing the application of these standards in professional practice.

Our study sought to enquire from staff:

- 1. How they **feel** about different ways of using technology.
- Whether the signature graphs (see below) of Thanet College can be used to make appropriate assumptions and predictions about staff attitudes and motivations and their use of technology with learners and peers
- 3. Whether the capacity plus Capability hypothesis defining e-confidence as an aggregate of organisational capacity and the mobilisation of individual capabilities in the organisational context, can be used to make a rational positional statement on e-confidence in College.

By introducing the notion of 'feeling' we suggest that there is an emotional response to new technology challenges and there is an element of particular aspects of intelligence required in those showing most capability in terms of initiating and sustaining changes in process and practice. The greater capabilities flow from particular intelligences, relating to the ability to create new approaches and synthesise new methods into established practice This fits with our general idea that a willing person, manifesting confidence in themselves, a curious and imaginative nature will meet challenges far better (and therefore have a far better chance of a good outcome) than a person who avoids or generally reacts adversely to new technology. By way of illustration, we wanted to know if staff at the college felt blogging had;

- no place in college;
- had been tried, but the respondent had struggled in its use;
- was interesting in terms of personal practice, I;, or
- respondents were using it routinely etc.

(Reference I found is http://www.camsp.com/cornerstone/5minds/)

In other words the question asked 'how do you feel about blogging' rather than what are your skills or what technology do you use to blog. Perhaps a more marked example is seeing how staff feel about using technology for writing in specific contexts, rather than measuring Microsoft Word skills. Some support for this analysis can be seen in the recent work of Jephcote and Salisbury¹⁸ in this journal. They have explored the views of teachers in further education in Wales and in the Teaching and Learning Research Programme, with its wider brief, finding that teachers in further education place a greater weight on their relationships with learners than other demands on their time and that emotional attachment to different aspects of their work defines the attitudes of teachers to different tasks.

Our contention is that a measurement of potential and, to a degree, the desire to explore that potential is, when linked to the college capacity, a more effective measure of e-confidence than those which place a greater emphasis on the technology and systems – e-capacity. The value of such research is not to validate the status quo in terms of current use, but identify how staff and the institution as a whole can respond to both predictable and non-predictable change endemic in the operation of providers in the post-compulsory sector since 1992 and make more effective use of technology.

Asking staff to grade an ILT activity by 'feeling' gives a sense of where the college is going in its effective adoption of technology rather than the more conventional

profile, that measures where we are up to, and where we have come from. The research told us what areas of e-learning we should act on next because of the volume of staff ready to explore it. This 'pushing against an open door' approach to training takes us from standardised training to a more personalised needs met approach that may have value as a model in the work with learners, having a new emphasis on collaboration, sharing and individual approaches to learning. This is consistent with the findings of Salisbury, Jephcote and their co-workers – see above.

The Methodology

We asked all staff (no group was excluded) how they **felt** about the following elearning activities:

- I assess using the Learning Curve (College VLE)
- I use SMS texting
- I meet colleagues and/or learners on-line
- I produce information using technology
- I use sound files in my work
- I use images in technology
- I reflect on my work and personal development
- I blog (a web log is an on-line conversation space normally in the form of a diary or reportage)
- I see teaching and learning as a joint enterprise for staff and students
- I contribute to learning communities
- I share resources and ideas
- I collaborate with others in College and beyond

We devised a series of responses that reflected 5 states between, no connection with the idea through to normalised use such that the use of technology is so embedded in personal practice that it is not really commented on as a day-to-day activity. The statements followed the MIT maturity model using responses such as, *localised, co-ordinated, transformative, and normative*. Previous work using this model within the Becta E-confidence Framework had demonstrated its value as a conceptual model and that it would be readily understood by those using the level descriptors. In order to ensure this was appropriate for individual responses, we added 'no understanding of value' and removed 'innovative' from these categories because of the difficulty in posing a suitable statement at the level of an individual response. In all, 203 staff out of a compliment of 360 completed the questionnaire. Staff had to choose a reaction that most closely approximated with their position. For each activity this provided staff with a range of eight possible responses. The findings are detailed below.

The Findings.

The raw data for the study is as follows:

	Unsure	The e- explorer	The e-	Early	Transformin	l involve	lam	Normative
I assess using the College VLE	28	84	32	10	26	10	7	6
I text (SMS) at College	5	84	56	12	8	14	3	21
I meet colleagues and learners on-line	2	56	30	69	4	35	3	4
I write using technology	12	12	23	5	29	11	25	86
I use sound files in my teaching	38	122	7	23	9	1	0	3
I use images in my teaching	8	70	44	13	8	8	15	37
I reflect on my work and personal development	14	38	33	10	12	22	44	30
I blog	34	133	11	1	13	2	1	8
I see teaching and learning as a joint enterprise	31	17	25	20	8	38	2	62
I contribute to learning communities	44	56	53	8	12	16	2	12
I share resources and ideas	6	70	41	11	25	36	3	11
I collaborate with others	10	50	15	22	19	13	17	57

Discourse on the data formatting

From this position we distilled the 8 columns into 4. We kept 'unsure' and 'normative' as collected and distilled the others as follows:

- 'explorer', 'investigator' and 'adopter' into a new heading called 'rising interest'
- 'transformation' and 'involve others' into 'current change'.

We wanted to hive off activity that had a negative reaction at one end of the survey and activity that was 'normal', showing assimilation into College and professional life at the other.

Learning technology is another tool in teaching and learning and normalising its utility is the goal. ILT should then only be concerned with the new and challenging areas. If this were not the case we would still be claiming the telephone as an elearning tool for example.

This left us with the middle positions with what excited people to explore and what they felt of worth that they were currently struggling with. This is the happy hunting ground of learning technology and those involved in staff development and training where technology is involved.

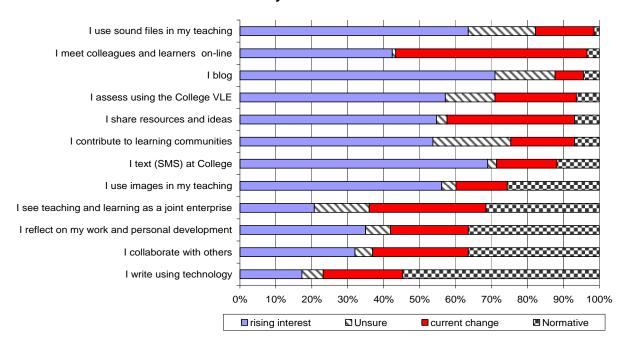
The revised research gave raw data in the new four groups as follows:

Revised Data table

All Data	Unsur e	rising interest (not saying 'no'?)	current change	Normativ e
		,	•	_
I assess using the College VLE	28	126	36	13
I text (SMS) at College	5	152	22	24
` ,	Ū	.02		- '
I meet colleagues and learners on-	2	155	39	7
line	2	100	33	,

Teaching Technologies in FE - an issue of capability creating capacity			Thanet College		
I write using technology	12	40	40	111	
I use sound files in my teaching	38	152	10	3	
I use images in my teaching	8	127	16	52	
I reflect on my work and personal development	14	81	34	74	
I blog	34	145	15	9	
I see teaching and learning as a joint enterprise	31	62	46	64	
I contribute to learning communities	44	117	28	14	
I share resources and ideas	6	122	61	14	
I collaborate with others	10	87	32	74	

All staff by Normative behaviour



Discussion

The range of possible reactions to each activity was too complex. In an attempt to accommodate a wide range of responses, we gave staff too many choices such that staff were not able to readily discriminate between the eight statements. Subsequently, it was difficult to clearly distinguish one response from another. To get round this problem, the results were re-allocated from 8 into 4 sets of possible responses. This revision gave respondents more statements to consider and match themselves against, providing the authors with the opportunity to draw more general conclusions about the position each respondent took. We believe there is some value in taking this approach as a means of more accurately reflecting the responses provided by staff.

There were some activities we wished to ask about that were related directly to teaching. It was illogical to ask the College electrician about assessment of student work yet in order to accommodate all staff we were in a position where the

statements clearly lacked meaning in the context of some work roles and would be better dealt with in future through the use of more differentiated questions in a revised tool.

To develop a measurement of the College as a whole we did not differentiate between staff roles although subsequently we differentiated between teachers and other staff because we wanted to see if a different profile emerged based on the work done with teachers and the effect of the expectations of students in teaching and learning activity. Our data gathering instrument allows us to distinguish between those who teach and those in other roles, but even in a college the size of Thanet College, the size of the other staff groups was not large enough for us to extrapolate statistically significant comparisons e.g. between technicians and administrative staff, although further projected activity with other colleges would allow us to start to develop statistically significant samples to undertake such an analysis.

What general conclusions can we draw

- 1. Whilst colleges may have similar patterns and shape to their capacity Hardware, software, networks and competencies, the capability will be unique to the college, as it is coloured by the culture, recent training, successful projects and the degree of experimentation carrying on by the early adopters. Each college will have a unique e-confidence signature.
- 2. It may be more accurate to talk about a College narrative in the absence of a College pattern
- 3. Early adopters are crucial in changing how e-learning is used because of the effect they have on capability
- 4. If capability relates to a state of mind, then e-confidence can increase without a corresponding increase in capacity, the capacity is simply used better. E-confidence is not restricted by capacity except in the most limited cases of technology adoption.
- 5. Working with technology in abstraction makes it harder to assess impact because technology always works best when set in context and delivered in terms of what is happening in the college already.
- 6. If one is to get the best from training then working with staff where there is the greatest interest and motivation already will make for easier training and this will be more likely to have a significant and lasting impact on the College.
- 7. It is through staff, who work alongside their colleagues, that the greatest potential for supporting technology implementation and development occurs.
- 8. Of more interest is seeing where staff find a rising interest in the use of technology. The high interest in blogging and the use of sound files with low normalisation suggests that should the College concentrate on introducing podcasting it would see the quick uptake of this technology by teachers.
- 9. Staff are currently engaged in collaborative and reflective working which has been a major training drive over the last 6 months, suggesting that training has engaged staff rather than simply run aground.

- 10. Interest is rising in methods of working with learners and colleagues rather than the abstract use of technology.
- 11. The data is too granularised to show any regular pattern and is in effect a unique college signature. To test the uniqueness, the signature would have to be measured against other colleges.
- 12. The rising interest and current change is mainly driven by the experiences and exposure of people to technology in action by learners and what they bring onto college from their private lives.

The College Wave Signature

It is possible to aggregate the occurrences of response reactions. It is possible to get an overall incidence of reactions from uncertainty, through rising interest to the amount of ILT activity considered as normal activity. IS there therefore an ideal shape? Or, is the college "signature" a means of providing a sensitive analysis of staff training and support needs and input to self-assessment processes?

If one takes the view that:

- ILT is concerned with dealing with the new and challenging and introducing it
 into the college by subsuming currently novel activity into normal behaviour to
 the point that the technology does not figure in the commentaries of
 practitioners and their focus shifts to the learning and teaching activities
 themselves.
- 2. That ILT requires staff to be curious and positive towards challenging technology and confident in rejecting inappropriate technology for successful assimilation to occur.
- That this curiosity and persistence with challenge supported by appropriate training leads to normalisation of the use of technology for all aspects of a college's work.
- 4. That the uptake of ILT should be at a higher level than the 'unsure' if the capability of staff is to be improved to the level that it impacts across the college,

Then:

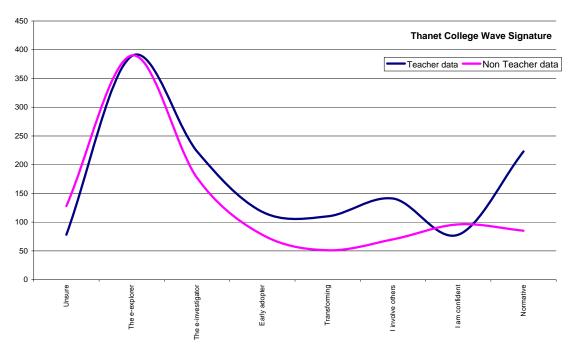
Further testing across a wider range of providers ought to make it possible to develop wave shapes that suggest **high capacity**, **high levels of capability or both**, **to give a measure of e-maturity**.

Starting the wave from a low level of uncertainty; some drop off will occur in the use of an individual aspect of technology, which is followed by a steep rise in curiosity and exploration, then some falling off as initial interest wanes and is not picked up by some, finishing with a horizontal or spiked normative position where the technology is integrated into everyday activity. Too high a level of normalisation suggests that the activities chosen to assess the level of maturity are no longer true 'cutting-edge' ILT activities and require little intervention in terms of training or formal support.

An ideal shape?

For this College we have shown a teaching wave and all other staff wave. We wanted to demonstrate that the change in wave shape represents the difference in attitude.

In the graphic below, the tutor and staff other than tutors have been separated to demonstrate a difference in attitude to progression. The graph is based on the data presented above.



Conclusions

- 1. **All** staff indicate that they are curious about emerging technologies and how they might use them.
- Teachers who do better at maintaining interest and perseverance, seem to achieve to higher success rates in the use of emerging technologies.
 Whether there are training or support mechanisms to sustain interest and motivation may be indicative of organisational e-maturity.
- 3. Support staff are equally confident in using emerging technology. The spike in the teacher tail suggests that the software challenges introduced are simply more likely to be used by teachers (because of the emphasis on teaching software) and they are more likely to use technology in their working day.
- 4. High 'rising interest' responses relative to 'unsure' responses, relative to 'current challenge' is a positive measure of e-maturity. It supports our hypothesis that capability is a measure of potential which in this case is a measure of willingness to change through the exploration of the use of technology to support work activities. The capability developed, when added to capacity, is a measure of e-maturity.

Being able to access and use the current range of tools available for staff and managers such as Becta's "Generator" will enable us to undertake a guided self-assessment and test this model against manager and staff perceptions in other contexts such as quality improvement and Inspection. By using the Framework evolved from the Becta work reported above, provides a measurement of capacity through the utilisation of its constituent statements.

Future research

Future research should consider what a measurement of capability might be established e.g. taking account of the work on organisational capability ¹⁹ Measurements of the rate of change of attitude are notoriously difficult to create, but it may be that the model outlined here can assess the speed of change in

different contexts and then make deductions about the forces at work that accommodated the pace of change e.g. funding, management practices and historical factors.

As noted above, it is hoped to initiate further work with other colleges in 2009-10 to explore the use of the model outlined in this paper and undertake a more rigorous testing of the methodology developed at Thanet College. Issues to be further explored include;

- Differences in responses between staff teaching different subjects
- Wave profiles for different categories of staff e.g. technician and administrative staff
- The impact of training activities developed from the needs analyses provided by this approach
- Comparison of the results from a number of colleges with needs analyses and e-confidence assessments derived from other models e.g. the findings of the survey of Scottish colleges and the findings emerging from the Becta Harnessing Technology surveys in the FE and Skills sector as well as the use of the "Generator" tool.
- Profiles for different grades of staff.

With the increasing concern in the further education sector with self-assessment and quality improvement, methods of assessing the development needs of staff in colleges and other providers in the sector will increase. The recent introduction of the 14-19 Diplomas in England require providers to work collaboratively and manage their record-keeping through consortia and make effective use of technology for teaching and learning. The present work, while focussing on a single college is grounded in the wider issues facing post-compulsory education in the UK and internationally and, it is hoped, will provide the starting point for further discussion on the development a means of identifying the capability and potential of staff to contribute to the e-confidence of their organisation.

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