Embedding mobile technology into university strategy: A discussion paper on ALPS

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Introduction

For the past two and a half years, I have been researching the ALPS project from the perspective of a Business Information Technology expert looking into how a new and potentially disruptive technical innovation in the form of mobile learning, interacts with the HE organization and how it might become embedded within the institution in the longer term. Hence I'm not really going to focus on the pedagogical aspects of using mobiles for assessment purposes, nor am I going to focus on the choices of technology or the many technical issues that ALPS has had to resolve.

During my period of ALPS research I have received an open and encouraging cooperation from all of the partner sites. I have been interviewing key participants in each partner institution, focussing on roles such as the site leads, IT staff at all levels, tutors whose students are using the assessment suites, learning and teaching fellows, project managers and learning technologists. I have also attended as an observer, the ALPS Tools/IT group on a monthly basis, and various conferences and events organized by the ALPS project management.

It's fair to say that what follows is an early insight into some of my observations and findings and thus is not a rigorous academic paper but more of work in progress. It reflects a presentation I have given to the IT group and at the ALPS conference in March of this year. I am planning to submit my PHD thesis in the autumn of 2011 so this is just a snapshot of where my research is heading a much more rigorous analysis of the data is required before any firm conclusions could be defended. I have also been looking into mobile learning projects in other universities so the information below is part of a wider study.

Disclaimer

The findings and statements within this paper are my own views and interpretations as an independent observer and hence I am not representing the project or any of the project partners and so none of what follows should be taken as an agreed ALPS position or outcome.

Embedding Issues that have arisen in ALPS

There are many issues which challenge the introduction of mobile learning technology into a university institution. I presented a paper at Mlearn 2008 (Bird and Stubbs, 2008) which listed some of the issues that make mobile technology challenging to the university organization and some of these are also discussed briefly by John Traxler in the handbook of mobile learning (Traxler, 2005) so I'm not going to re-iterate those here but instead focus on newer issues that have arisen in ALPS.

The mobile contract models promoted by operators are clearly tuned to the needs of consumers and business users and are perhaps not suited to using a device for learning purposes. The cost of downloading data is one key element but so is the life of the contract and the opportunity to upgrade the device to keep in line with technology trends. ALPS demonstrates the potential problems of providing students with devices in that clearly the project was impacted by being constrained to second generation download speeds when 3G was becoming the dominant choice. It's also likely that the launch of the iPhone™ part-way through the project would have raised students expectations of what can be achieved with a smartphone and rendered older devices as slow and clunky. The issue here is not the chosen technology – ALPS made an entirely reasonable decision on device choice and were also constrained by the need to purchase all the devices within a short window of time - but that changes in market expectations can render existing devices into looking obsolete. For the most part this has informed ALPS partners that widespread embedding probably means supporting students own devices but of course this brings other problems of managing the applications that reside on the students devices and who pays the cost of accessing the data. In the future, there may have to be operator charging models such as student pays for call/text usage and the university pays all or part of the data usage. What's clear is that while mobile learning remains a niche application in a few university subjects such as medicine, then operators are unlikely to start putting forward generic charging/upgrade contract models which would meet the flexibility required.

Another issue is that of ensuring security on devices. In taking devices into clinical situation with the possibility of recording information in many multi-media forms, it is not surprising that NHS trusts would be concerned about the security of information that students might collect or input and what might happen if the device was lost or stolen. ALPS has been pioneering use of mobiles in clinical situations so had to be seen to be taking the security issues seriously in order to gain support for the project from the various NHS trusts. This required ALPS to install extra security software on the devices and this in turn added complexity to the device setup procedure. There is perhaps an irony in the fact that many hospital staff undoubtedly have access to smartphones so in the longer term trusts will have to evolve their approach especially against a background where hospitals have lifted restrictions on visitors and patients using mobiles. Again the project has had to pioneer issues in this area as more recent phone technologies have built-in security and can be disabled remotely, making the risks easier to manage and not requiring additional handset software to be installed.

Mobile estate management is another issue that ALPS had to contend with having issued over a 1000 devices across five institutions. Surprisingly there have been few lost, stolen or damaged devices but plenty of issues with missing power supplies and memory cards, particularly when students have returned devices for re-allocation or software upgrade. Potentially this issue goes away if we are to go down the route of using students' own devices but still we may face issues of trying to ensure all students have the latest version of the mobile assessment/learning software. If students are provided with devices, it might also be possible to have third parties such as mobile service providers or re-sellers managing the estate of devices i.e. outsourcing the problem.

ALPS has also demonstrated that keeping engagement with students (and staff) relies not just on the reliability, complexity and speed of the mobile platform, but also generating regular levels of engagement. Given that assessment is normally an infrequent activity then that alone may not generate sustainable usage. ALPS has recognised this and various partners have tried to increase engagement by giving students access to student email or providing learning objects such as training videos of clinical procedures. This bears out other research where I have been looking at use of text messaging to communicate administrative information with students such as cancelled lectures or library notifications. If a student gets infrequent contact then they will dis-engage. There needs to be a variety of administrative messages and other forms of activity such as email to encourage students to take up these services.

Whilst the above points focus on issues/problems that prevent embedding, there have also been positive discoveries by the ALPS team in terms of students with learning disabilities. When I interviewed experts in mobile learning in 2005, some expressed concern about the possible exclusion of students with disabilities, such technology could bring. Although this remains in part a concern, it is good to see that ALPS has trialled devices with students with learning disabilities and has achieved positive results (Dearnley et. al., 2010). Also important in the health sector that ALPS occupies is the work done by Stephen White at Huddersfield on the possible infection control risks that devices may carry.

Embedding and Actor Network Theory – the points of passage.

In undertaking my research, I am treating the introduction of mobile technology into Higher Education as an innovation and this the theoretical aspects of my work will focus on theories of innovation diffusion such as those long established by Everett Rogers (Rogers, 2005) or Geoffrey Moore's idea of crossing the chasm between prototype technology and embedded product (Moore, 1999). Much of this innovation diffusion theory places the innovation at the centre of events whereas I was more interested in the roles of people, processes and internal politics as my 'lens' on the data. I was attracted to Actor Network theory (ANT) and its ideas of networks and translations especially in the context of looking at the introduction of an innovation (Mobile learning) into a university organization with its diverse faculty structure, loosely tied together by a central administration.

Actor Network Theory (ANT) introduces the concept that 'agency' (Latour, 2005) resides both in people and objects such as technical innovations. Agency is usually thought of in terms of humans making conscious decisions to exert influence but Actor Network Theory propose that objects can also have agency, an example being a particular technology having influence (i.e. agency) over how humans perform certain tasks. Text messaging is a good example in that it has changed the way that many people organize their social lives, much to the surprise of both technologists and sociologists (Faulkner and Culwin, 2005).

ANT prescribes that all entities, both human and non-human, be subjected to the same process of social analysis (Law, 1994). ANT identifies the set of processes involved in projects of social ordering as networks and looks at the changes that take place in those networks through a project. ANT also provides a concept of translation whereby people, objects and processes have specific 'needs' which are translated into more general and unified needs, enabling all needs to be met by one solution and hence creating the possibility that that solution might sustain and embed into the organization. When a system is introduced it gets adopted by the users by translating it into their own context and reflecting their work tasks and situations (Latour, 2005). An organization might develop a number of possible solutions or innovations that have a broadly similar purpose and this gives rise to the idea of competing translations. ANT also provides a concept of irreversibility where a network is established that can resist competing translations, making the change irreversible. Actor Network Theory may provide a useful model for looking at m-learning in higher education as the various actors (the university, teachers, students, IT services, the innovation itself etc.) could be viewed as undergoing a process of translation in order to find a stable way of working together. Notions of reversibility of current arrangements within universities, and the processes of translation orchestrated by those championing the introduction of m-learning, may enable important differences to be identified between universities that successfully and sustainably embrace and implement forms of m-learning and those that are unable to 'translate' irreversibly.

Whilst Actor Network Theory and its notions of networks and translations would seem to lend itself as a method of looking at how these barriers are overcome, another part of ANT is even more promising. Looking at project failure in the aircraft manufacturing industry, Law and Callon came up with the concept of local and global networks and the boundaries between the two (Law and Callon, 1992). They identify three factors which influence the success or failure of the project with the most significant being 'the capacity of the project to build and maintain a global network which will for a time provide resources of various kinds in the expectation of an ultimate return'. They also talk about obligatory points of passage between the two networks, which could be powerful individuals who exert influence over the global network or even powerful groups of people, such as strategy groups or committees.

The diagram (figure 1) below shows two networks that could represent what is happening in ALPS at an abstract level. Within an institution, ALPS is a cooperation between tutors, students, learning technologists, managers, suppliers, learning and teaching fellows and clinical assessors. A 'local' network forms in order to bring about the goals of the ALPS project i.e. students perform competency assessments on mobile devices whilst out on clinical practice.

Embedding is a function of how that 'local' network builds links with the rest of the university and particular the executive and the strategies surrounding provision of IT, resources and learning and teaching. The 'global' network of the university executive and middle management will need to provide resources in order for the mobile technology to be both sustained within its current area of healthcare and potentially spread into other subject disciplines. There is also the need for the lessons leant from ALPS, by that local network, are input into the institution mobile learning strategy so that future strategy is better informed. I will not expand further on actor network theory in this discussion but I hope this gives the reader an insight into how it could be used. I will now consider some observations about ALPS which show where links between the local and global network can be demonstrated by the project experience and issues that may impinge on this.

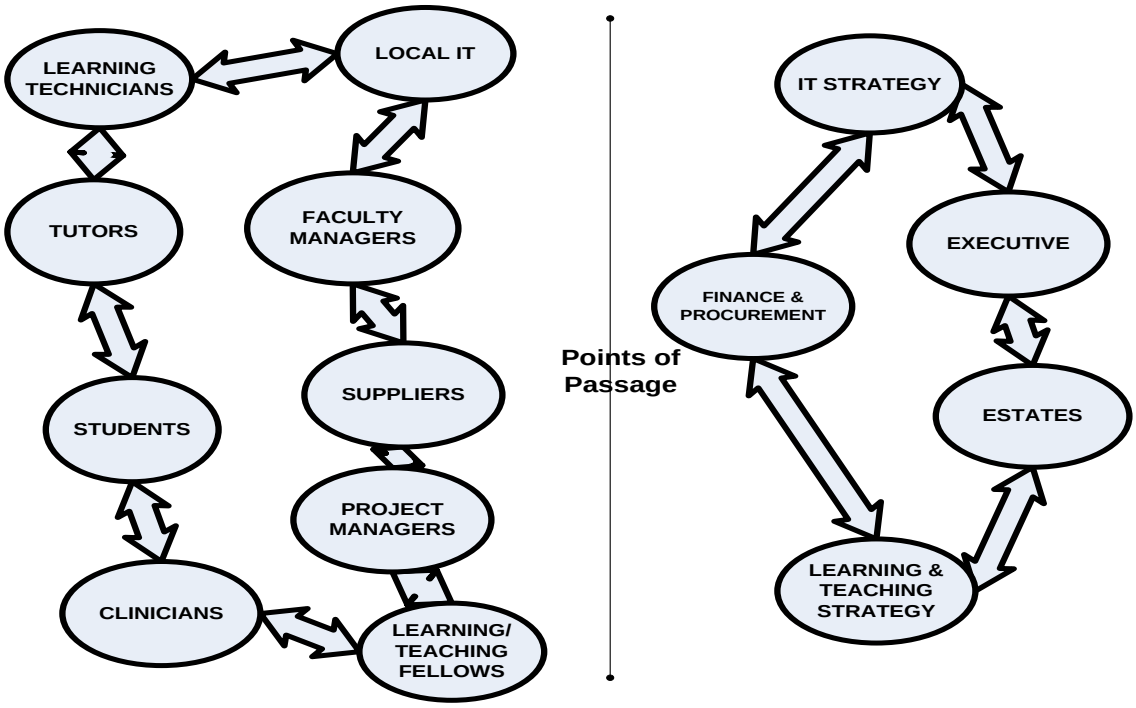

Figure 1: The ALPS 'networks'

Points of passage in ALPS

In conducting my research the links I most closely followed was that between the project and the respective institutions IT services function. It also emerged that as ALPS had sponsored learning and teaching fellows within each partner, then those individuals also where a conduit (or point of passage) between the project and the institution's learning and teaching strategy. Perhaps also there is at least a third level of interaction between the site leads, who are often people in senior positions within their faculties, and the university executive, but that is an area for future analysis of the data.

The IT point of passage

A factor in the strength of the link between the ALPS project and the institution IT strategy, may be the structure of how IT is provided. Some intuitions have very centralised system where IT is all provided by a central function whereas others have much more distributed models where faculties have considerable autonomy in the provision and may even provide their own file servers which are supported locally. In this more distributed structure the central IT function is focussed on providing infrastructure i.e. networks and wireless networks across the university campus and buildings. There are also examples of another division where there is a clear separation between the standard IT provision of networks, servers and desktop applications and learning technologies such as Virtual Learning Environments and indeed it is common across UK HE to see learning technologies have a separate role from that of standard IT provision. However it would not be appropriate to judge which of these structures and divisions is the optimum as there are many business reasons as to why they are structured in specific ways. Primarily these will be down to cost of delivering services and a debate between stronger central control versus more local faculty freedom. It would be unreasonable to expect IT to be primarily structured to optimize the introduction of a new learning technology such as mobile assessment. However it is useful to look at IT service structure to illustrate problems which can occur at the point of passage between the mobile learning project and IT strategy. In other words mobile learning technology may have an impact on learning technology strategy and IT infrastructure and not be confined to the compartment of mobile learning.

A good example is perhaps the ALPS choice of software which used MyKnowledgeMap™ which wasn't the chosen E-portfolio of all the instutions involved. Initially there were interoperability issues between that choice and other tools such as Pebbepad™. These were eventually solved by using standards so that data could be exported/imported across different products but this illustrates the point that mobile learning needs to be able to fit into an institutions learning technologies strategy as there may be implications on the strategy for areas such as E-portfolios and Virtual Learning Environments. Another illustration is that ALPS wanted to achieve single sign-on from the device to allow access to both the assessment process and other facilities such as student email. This again can have implications on the institution authentication and infrastructure strategy. Other infrastructure impacts could also occur with some mobile learning applications such as increased wireless bandwidth or filespace and backup requirements.

ALPS have solved many IT interoperability issues over time, and the IT services group of all the institutions had representation at the ALPS IT Group which has met monthly through the project. Nevertheless different individuals attending the IT group may be closer to or further from the central IT strategy depending on how the respective institutions have structured their IT groups. The long-term question is whether this will have an impact on the respective institutions ability to take the knowledge from ALPS and convert that into their longer term mobile learning strategy.

Learning and Teaching Fellows

Another aspect of ALPS which bears investigation when it comes to embedding, has been the development of learning and teaching fellows. As with many of the CETL's, funding has allowed a number of staff across the five partners to be learning and teaching fellows. This has helped bridge the gap between tutors who may have to promote the ALPS technology to their students, and IT staff who are providing the technical support and training. It has also helped link ALPS with the institution teaching and learning strategy particularly where these is cross-faculty sharing of learning and teaching innovation perhaps chaired by a pro Vice Chancellor with responsibility for the overall learning and teaching strategy of the institution. This could be an effective network to share the experience of projects such as ALPS across the institution and encourage embedding, a link between the local and the global network as depicted in Figure 1. One might speculate that this type of learning and teaching fellow role may not continue in its current form with the CETL's reaching their completion and an uncertain funding outlook for the sector. This will make it more difficult for learning and teaching technologies to diffuse within institutions as that locally gained knowledge is perhaps not shared into the global network of the university and also perhaps more difficult to bridge the gap locally between information technologies and teaching staff.

What is embedding?

We have to be careful with a project such as ALPS in judging what is being embedded as it has many facets including competency maps, service user involvement and mobile technologies. It is easy to see that the competency maps and the work done to strengthen service user involvement could continue and spread. But in this case I'm looking at mobile technologies where many barriers remain.

In interviewing many staff involved in ALPS, there are different views of what is meant by embedding and views differed both across the partner institutions and within institutions themselves. Does embedding mean an institution-wide approach where the concept of mobile learning and assessment starts to appear across a wide portfolio of subjects or could embedding mean continuation of ALPS like technology in one subject e.g. Medicine or within all "health" subjects? Many aspects of mobile learning will have particular niches which suit particular technologies – where activities take place outside the university premises such as clinical placements or fieldwork. So it would be unlikely that the concept of mobile assessment would permeate into all courses and impact all students. It's more likely that more generic administration tasks such as mobile portals into the VLE or library system will be the type of usage that creates widespread use of mobiles by students. Indeed many universities including some of the ALPS partner institutions are experemimenting with such services or products like CampusM™. Perhaps the 'stalking horse' for institution wide embedding of mobile learning will be such administration services; a form of m-admin rather than m-learning.

My view on what embedding would be is where institution IT strategies encouraged and supported the use of new mobile learning technologies and where good practice in one course

or faculty was visible to other parts of the institution so that innovation and both IT strategy and learning and teaching strategy had clear links. To put it another way, where such innovation was concerned, the links between the local and the global are maintained in some permanent way.

The way forward?

It's worth stating again that these are early findings and there may well be riches in the data yet to be discovered. But two things stand out as possible embedding "solutions".

Firstly the way that ALPS has supported and used network and teaching fellows is one method of both bridging the gap between IT experts and teaching staff and forming a network with other "fellows" which allows knowledge to spread to other parts of the institution. If there is also someone in a senior position who is close to the institution executive who effectively "chairs" the network of "fellows" then that improves the possibilities of institution-wide spread of knowledge and good practice.

Secondly I have commented on the links between the mobile learning project and the overall institution IT strategy. There is a tendency for technology innovation projects such as those funded through JISC and HEFCE, to be somewhat self-contained and although the executive and senior management are usually aware of these projects, they don't see them as creating core knowledge. When I talked to representatives of ten HE institutions across the UK in 2005, there was plenty of evidence that m-learning was not seen as core business by university IT departments and indeed some evidence of pro-active dismissal that this could be part of IT Services role.

ALPS has moved this process on by involving IT services from the beginning of the project and forming an IT group with representation from IT services in the five partners, to manage and monitor the mobile technology introduction. It would also be wrong to paint a picture that the IT directors of the five partner institutions were not involved in ALPS. I interviewed senior people in all five partners and they were well aware of and interested in the project and its outcomes. In addition the IT group have organised joint meetings to discuss embedding strategies with the senior IT staff from each of the partners. But does this go far enough in bridging the gap between the ALPS project and future IT strategy?

I have come across another approach outside of ALPS which might help bridge the gap between a project (the local) and the university strategy (the global). Rather than see a technology research project as some separate entity not linked to core business strategy, the institution views the project as its first step or trial of the new technology and maintains a clear link between the project outcomes and the long term strategy. In other words there is a formal link from the start and an expectation that the project outcomes will inform the strategy. If the outcomes are positive, then the institution moves into another stage of the process perhaps trying it out over a wide range of subjects or areas before eventually moving to an institution-wide deployment. This is perhaps only a subtle difference in approach but it perhaps changes the emphasis from mobile learning project trying to lobby the institution to take a close interest to institution using the outcomes to pro-actively inform strategy.

Summary

The discussion above has looked at a number of issues that have arisen during ALPS and possible solutions to how technologies such as the ALPS mobile assement plaftofom could become embedded. Of course there are only impressions and one can only comment on embedding strategies that seem more promising than others. And we have seen that the meaning of embedding is by no means universal. Only time will determine which of these strategies (or indeed different strategies) will prove fruitful and whether there will be any marked difference between the embedding outcomes of the five ALPS partners.

What is certain is that ALPS has provided a rich source of data that each of the partners can gain from and a unique opportunity to trial mobile learning on a larger scale than has been previously attempted in UK Higher Education. And this will not only benefit the ALPS partnership but also the sector as a whole.

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