Please cite the Published Version

Undergraduate student researchers – the Ultraversity model for work based learning.

Ian Tindal, Stephen Powell, Richard Millwood.

Abstract: Technology is creating a global learning landscape for the 21st century; if Higher Education Institutions are to continue to meet the needs of today's learners they must explore approaches where the role of technology is central to new models for learning. The four year long Ultraversity project was set up by Ultralab at Anglia Ruskin University to explore the development of a wholly online, three year duration, undergraduate, work-based degree with students using action research methodology. The experience is designed to be highly personalised and collaborative in nature, rather than individualised and isolated. Students engage in the processes of inquiry together, making it possible to collaborate and support without plagiarising because they are studying in their own work context. This paper describes this model of personalised work-based learning and the Internet technologies used to connect the distributed student body and teaching team. Issues are identified relating to the model and the tools used to support it.

Keywords: Work based learning, personalised learning, e-learning, learning technologies, assessment for learning, higher education, independent learning, critical thinking, creativity, e-portfolio, institutional risk.

1 Background

The four-year Ultraversity project started in January 2003. It was devised to research new approaches to learning in Higher Education Institutions (HEI) and to address the government priority for HEIs to widen participation and fair access (HEFCE Strategic Plan, 2005).

Conventional models of study at University fail to meet the needs of many students and employers. Today's workforce is mobile and aspirational; they seek personal development. Meeting their demands requires approaches that are personalised, this gives students choices about what, how, and where they study. Employers are becoming increasingly sophisticated in their expectation of training, Charles Jennings (2006), Global Head of Learning Reuters identifies an evolving need; "What is in fact required in organisations is a change from training for skills to 'learning for performance". The traditional topic based approach to HE learning prepared students well for specific futures in an era where 'a job for life' or a career in academia was a common expectation of HE learners. A growing trend will be the ability to remain in the workplace whilst studying, to earn a living, and keep up-to-date with fast changing professional contexts – lifelong and lifewide learning (Reichmann, 2003).

2 Personalisation of the learning experience

Harvey (2005) uses the term "Work-Integrated Learning" when describing the Open University's development of a generic work-based learning framework that has the

potential to be adapted to a wide range of subject specialisms. As its starting point, this approach has much in common with the Ultraversity model in its emphasis on the motivational imperative of self-direction, learning from experience, and problem or task-focussed orientation for the adult learner drawing on Knowles' theory of Andragogy. By developing a generic framework for work-based learning, where the emphasis is on the students' ability to critically evaluate the work environment, it is possible to use a wide variety of work settings to enable the student to gain higher education credit points for their work experience. The concept of 'undergraduate student' as 'researcher' developed by Ultraversity goes one step further in that it moves away from the prescription of a curriculum, thus allowing the learner a high level of discretion in identifying relevant theories and models and applying them to authentic learning opportunities in their workplace.

Another active area of research into personalisation of the learning experience is through computer-interpreted behaviour and includes work on IMS Learning Design and a long tradition of approaches under the term Adaptive Hypermedia. Burgos, Koper, and Tattersall (2006) discusses personalisation in terms of adaptation identifying three agents in this process including the learner, the teacher, and the set of rules derived from other stakeholders. For Koper, this approach to personalisation is seen as problematic from a resource and time standpoint as mediation between agents would necessarily be complex. IMS Learning Design offers the possibility of a technological solution to adapt the learning experience offered.

The attraction of this approach is obvious for a programme of learning based around a subject-discipline with content that is predetermined and where student study contexts are closely aligned. The complexity of research driven learning developed by Ultraversity is more difficult to design adaptive systems for and the Ultraversity project has chosen not to pursue this route, instead achieving personalisation through a process of dialogue based negotiation between learner and teacher. Coats and Stevenson (2006) explain this as a process whereby "both teacher and student play an interactive role, in which teaching and learning are seen as complex and socially mediated". In the online context, Stephenson (2001) identified the particular challenge of aligning the expectations of learners with those of the teachers in terms of approaches to teaching, learning, and assessment to be taken when student and teacher do not meet but communicate via the Internet.

It is apparent to the authors that approaches based upon computer interpreted behaviour would potentially have much to offer students on a programme such as Ultraversity in the developing of specific skills to support them as learners.

3 Ultraversity Approach to HE

To research the issues outlined above, the Ultraversity project developed an undergraduate degree programme, BA (Hons) Learning Technology Research (BALTR). The programme is delivered fully online with no face-to-face study. Internet technologies are deployed to offer Higher Education in new and creative ways for people in full time employment, in work they wish to pursue and to provide the opportunity to improve their performance in the workplace.

In developing the programme, many of the 'standard' HE organisational boundaries were 'tested' (fig 1) including the incumbent University technological offerings, organisational practices, curriculum design, approaches to learning and teaching and assessment.
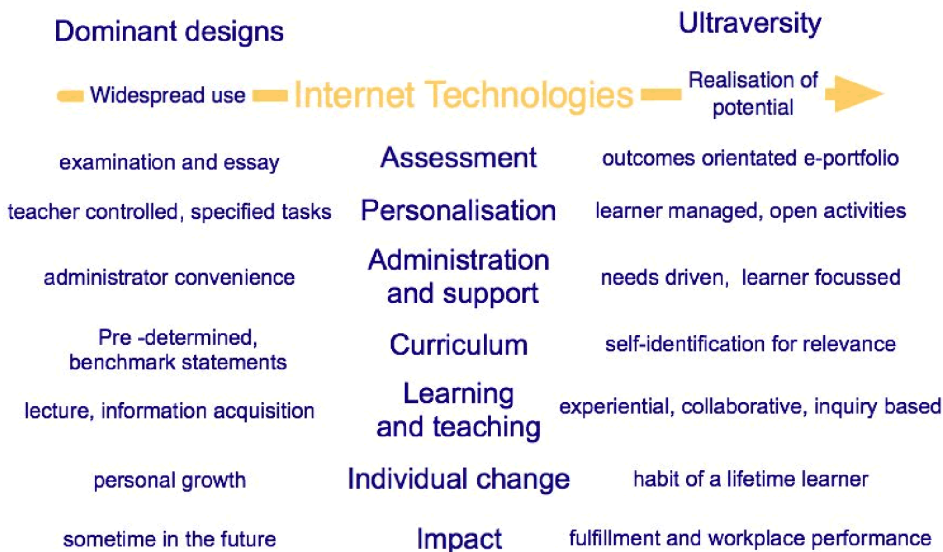
Approach to HE

Dominant designs

Ultraversity

➡ Widespread use ━ Internet Technologies ━ Realisation of potential ➡

Dominant designs		Ultraversity
examination and essay	**Assessment**	outcomes orientated e-portfolio
teacher controlled, specified tasks	**Personalisation**	learner managed, open activities
administrator convenience	**Administration and support**	needs driven, learner focussed
Pre -determined, benchmark statements	**Curriculum**	self-identification for relevance
lecture, information acquisition	**Learning and teaching**	experiential, collaborative, inquiry based
personal growth	**Individual change**	habit of a lifetime learner
sometime in the future	**Impact**	fulfillment and workplace performance

Figure1: An alternative approach for HE

4   Paper methodological approach

The findings in this paper are based upon research using a hybrid of systematic and naturalistic inquiry. The authors' experience as practitioner researchers developing the programme, and their observing and interacting with students is triangulated with data drawn from an online questionnaire (July 2006) focusing on student perceptions and follow-up semi-structured interviews (September 2006) to develop some richer understanding. The questionnaire was completed by some 65 of a potential 142 respondents and 15 semi-structured interviews were conducted.

5   Model of personalised work-based learning

This model has combined tried and tested methods found elsewhere in HE as well as developing approaches in teaching and learning in particular in relation to assessment and delivery of a programme using Internet technologies (fig. 2). There is an emphasis on the social, interactive and conversational nature of emerging web based services and tools – sometimes collectively referred to as 'e-learning 2.0'.
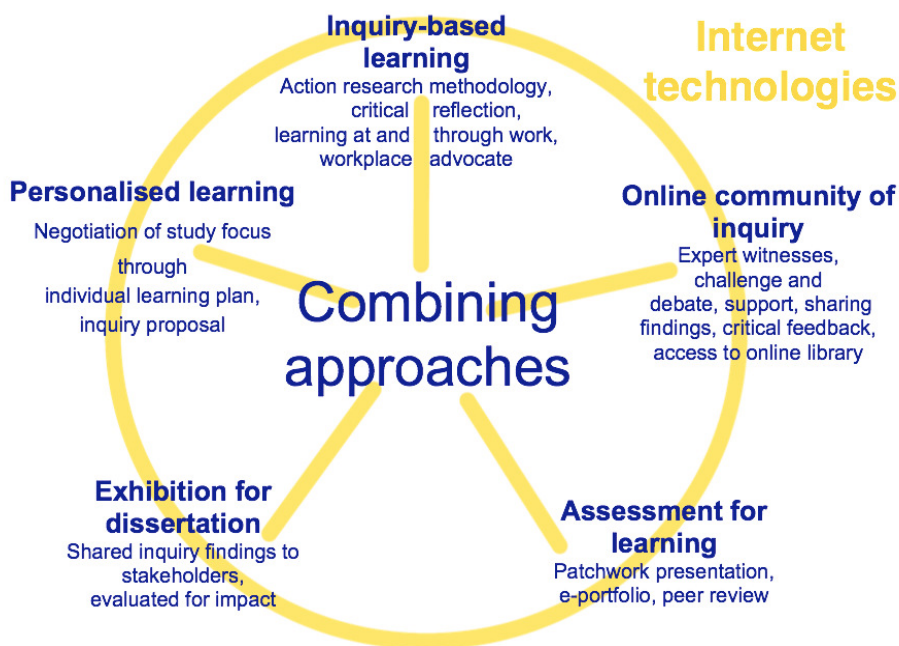
Figure 2. Model supporting workbased learning

6 Personalised learning

The BALTR curriculum design is a series of 'open' module frameworks of generic outcomes. Learners identify subject knowledge that is relevant to their own context and needs, and through a process of negotiation with teaching staff develop a set of learning activities and assessment products that are recorded in Individual Learning Plans and inquiry proposals - the tools for personalisation. The processes of 'learning' and 'inquiry' define the content of the degree with a focus on a practical understanding or 'knowing why and how to' in their chosen discipline. Inquiries are authentic and embedded in the daily work of the learner but also enables them to meet the requirements of the modules and assessment criteria.

The exit survey of the first cohort indicated that 86% of the students surveyed believed personalisation was a significant feature of their experience and 77% that their study was relevant to their needs.

> "I felt that the Ultraversity programme was ideally suited to me because I run my own business and therefore I was able to tailor the work to not only benefit myself but also to target specific areas of my organisation."

> Jack (2006)

> "The modules made it possible to tailor to my own needs. The title 'Work Place' degree says it all really, in every module we were encouraged to make it relevant to our situation and the Individual Learning Modules were constructed around this ideal. This made the tasks more relevant; I could see that the results would really make an impact, so I put even more effort into them. It didn't seem selfish to study. …..The Learning Facilitators offered great support and encouragement, they allowed the researchers to learn from each other, and discuss difficult issues, in my opinion this was

> the best possible help. I learned a great deal from researchers in the
> online community, deep issues were discussed"
>
> Binks (2006)

Harvey and Norman (2005) reports similar findings "Students have described how they were highly motivated by the fact that their learning in the workplace was valued and could be used within their higher education award."

7   Inquiry based learning

This is based upon Action Research methodology that has an emphasis on critical reflection on an individual's work practices and inquiry into their work context. This leads to an action that is planned, implemented and evaluated with the intention of making a positive impact on their work – learning for performance. This approach is designed to enable students to effectively integrate study and workplace activities with the support of a 'workplace advocate' who is identified by the learner as someone who can help with work place issues.

8   Online community

Researchers work and learn together in an online community environment where social construction of knowledge is realised through collaboration and critical friendship between learners. Engaging in processes of inquiry together as a cohort makes it possible to collaborate and support without plagiarising because learners are studying in their own work context.

The course designers valued unstructured or 'chance dialogue' (Powell, 2004) where learners initiate their own conversations, but also designed an experience that had opportunities for purposeful conversations initiated by teachers (Laurillard, 2002). This was achieved through the development of a facilitated online 'community of inquiry' where a rich experience of challenge and debate, support, shared findings, critical feedback, access to an online library, and conversations with invited experts could take place. The exit survey indicated that 62% believed that the level of collaboration was significant and some 35% that there was some collaboration with 3% believing there was no collaboration at all.

Participation in this community is not punctuated by the delivery pattern of modules, or determined by the access restrictions applied by Virtual Learning Environments (VLE). The Ultraversity model allows for ongoing interaction between students 365 days of the year. In addition, the choice was made to allow learning resources to be available outside the 'teaching' time so that students could plan and take responsibility for their learning.

Experts join the communities to 'host' focused conversations that engage learners in critical dialogue. This is not a 'lecture' by an expert, but an opportunity for learners to direct conversation to meet their own needs – in effect an 'inverse' lecture.

> "I found them quite helpful, I would look through the questions and
> answers and posed some myself, it was good to talk to an 'expert'."
>
> Binks (2006)

9   Assessment for learning

The project required the development of an assessment regime that supports the aim of widening access to HE on a national and international basis. Part of this approach was to attract students whose attitude to examination was negative, possibly because of experiences in previous periods of study. There are no timed examinations; students have the ability to express themselves through multimodality using an e-portfolio approach making use of alternate genre, rich media and technology such as video, audio, websites and weblogs.

The online technology rich model evolved from Winter's "Patchwork Text" model, with its emphasis on a reflexive approach and the use of creative imagination, peer review and discussion, "It's time we found an alternative to the student essay. For tutors across the country, it's marking time again and, reading essays, we realise that many of our students have yet again taken refuge in 'surface learning'." (Winter, 2003).

Students assemble pieces of work for their assessment e-portfolio with a 'retrospective commentary', which 'stitches' them together synthesising ideas and forming conclusions. This concluding activity should provide an honest view of the learning journey including learning from failures, celebration of success and identifying new questions for future inquiries. The exit survey indicated that 88% of students believed that they had developed critical thinking skills that were transferable to different contexts.

Students are encouraged and credited for experimenting with Internet technologies that support their inquiries and creative expression.

10 Exhibition for dissertation

Towards the end of the programme, learners are required to construct an exhibition of their findings primarily based upon the final year of their studies but drawing on the whole three-year experience. The exhibition is given to an audience identified by the learner, wherever possible in their place of work. This critical evaluation of the exhibition helps validate their findings.

Through this process learners demonstrate to themselves and stakeholders the progress they have made in terms of personal growth, and in their ability to perform in their work role. Initial findings indicate that students are engaging with the notion of being a lifetime learner. The exit survey indicates that 72% believe that study has had a positive impact on their career development with 49% reporting a positive impact on their salary already – that is before their degree was awarded.

The exit survey indicated that 70% believed that impact on the workplace was significant.

> The module requirements were generic, but the personal application of those requirements meant that I could tailor them to suit my needs and those of others in my school.

> Lancashire (2006)

The focus of individual student's exhibitions is analysed below and indicates the breadth of themes and workplace contexts in which the model developed can be applied to workplace learning.

What did they study?

Action Enquiry titles analysed by principal theme and workforce for 148 researchers in their final year, 2006

total in each theme	workforces / themes	care (1)	charity (2)	early years (10)	HE (1)	health (13)	LEA (3)	research (1)	school (117)
4	assessment					1			3
3	behaviour								3
17	communication			3		1	3		10
2	community				1			1	
2	CPD								2
8	environment	1							7
6	inclusion					1			5
28	learning			3		4			21
19	literacy								19
13	management					5			8
1	multicultural								1
2	numeracy			1					1
9	parents			3		1			5
17	pastoral		1						16
5	resources		1						4
7	special needs								7
5	teaching								5

Figure 3 What action did student researchers take?

11 Internet technologies

The Nesta Futurelab publication on Personalisation and Digital Technologies (2005), argues that there is already a high degree of personalisation in the experience of lifewide learners, however in the formal context this is still largely unrecognised.

Downes (2006) observes that despite the rapid increase in educational institutions adoption of Internet technologies, most people who inhabit the online world are in fact elsewhere. There are a myriad web2.0 spaces that enable them to generate and share their own content in ways that they chose to amongst their own 'learning networks'.

The trends and tensions outlined above can be seen playing out in the Ultraversity project since 2003 (fig. 4).
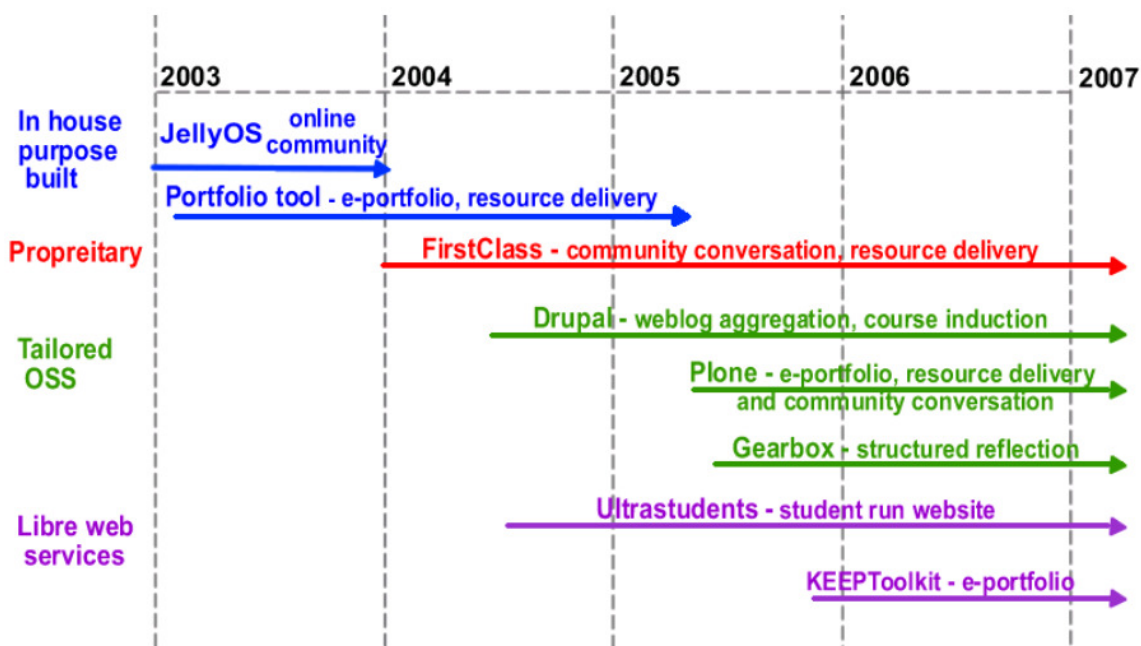
Figure 4 Evolution of Internet Technology Use

Initially there was a reliance upon in house purpose built tools and proprietary software. Although attractive in that it allows for a high degree of control over tools development, the resource requirements were significant making it an unviable approach. It was apparent that the next step was to harness the considerable potential resource savings offered by tailoring open source solutions (OSS) to our needs. An evaluation of options based upon technological, pedagogical and operational considerations identified Drupal as a web aggregator and as a vehicle for induction activities and the Plone content management platform for the realisation of our vision of a VLE.

Plone was selected as 'multilayered' technology providing a 'low threshold and high ceiling' (Papart, 1980) user interface with symmetry of use in the tools available to all user groups. Individuals with relatively low levels of technological ability have the ability to easily master a rich set of creative online tools and to develop 'virtual spaces'. Plone is supported by a strong open source community, and this should ensure that it is robust and likely to be a long lived platform.

With the increasing availability of 'libre' web services students developed their own community (www.ultrastudents.co.uk) where they could communicate outside the institution's provision. More recently, the Ultraversity project has itself adopted these libre web services such as KEEPToolkit, building their use into module activities as a formal part of the Ultraversity programme. Clearly there are advantages in terms of resource savings in using software developed and hosted by someone else, however there are also issues to overcome such as those posed by Quality Assurance and interoperability.

12 Concluding thoughts

Since the inception of this project, the www has evolved at a staggering pace. The use of learning technology in what seemed to be brave and experimental ways now appears 'pedestrian' when compared to what might be now possible.

Ian Tindal, Stephen Powell, Richard Millwood

The authors identify a vibrant academic discourse at the intersection of technology and pedagogy; however, they believe that adoption and innovation is located in isolated pockets of excellence only.

Findings from the first cohort of learners and the graduation of a large cohort indicate that our model of personalised work-based learning is successful for many students.

As the staff involved in the delivery of the degree have a well established background of working with online technologies and are an effective remote working team, there was little disruption in transferring to the Ultraversity approach. However we do not know yet how well a team used to conventional working practices would adjust to this technology based model of learning.

Developing learning technologies from scratch is attractive, as it allows for ultimate customisation, however, it can be consuming and expensive. Likewise, OSS software is also expensive to customise. Libre web services have become a viable alternative and offer tremendous opportunity for reducing the HE resource requirement. How sustainable this will be in the long run is unknown.

Our model of work-based learning has encouraged learners to take control of their own learning and explore beyond the 'approved' Internet technologies that we provide. We find that our learners are moving faster in their ability to explore and adopt Internet technologies than we as a project within an HE institution can.

The authors believe a step change in innovation and adoption will require a shift in how HE institutions view risk, "The fundamental barrier to change in education is the risk averse nature of the powers that be in a society that is characterised by risk" (Fryer, 2004). Rather than being perceived as the mavericks who threaten the wellbeing and reputation of HEI, risk takers should be nurtured and supported, their successes should be celebrated and no undue stigma should be appended to failure if institutions are to achieve successful innovation and widen their appeal to today's learners.

Acknowledgements

References

Binks, D., (2006) Ultraversity exit survey, semi-structured interview. Further information ,http://www.denisebinks.com/

Downes, S. (2006) Learning Networks and Connective Knowledge . The University of Georgia [online]. Available at: http://it.coe.uga.edu/itforum/paper92/paper92.html (Accessed 15th Nov, 2006)

Fryer, B. (2004) Personalisation and Choice. Presentation at e-Agenda Summit, Sandiego, USA. Report available at: http://www.stephenp.net/~stephenp/blog/archives/001156.html

Green, H., Facer, K., Rudd, T. (2005) Personalisation and Digital Technologies. Nesta.

Harvey, M., Norman, L,. Developing a Distance-learning model for Work-integrated Learning. The Open University

Higher Education Funding Council For England. (2005) The HEFCE Strategic Plan, London.

Jack, M., (2006) Ultraversity exit survey, semi-structured interview.

Jennings, C. (2006) Taking the Training out of Organisational Learning. Presentation at Informatology Conference, Reuters, London, UK. Report available at: http://www.stephenp.net/~stephenp/blog/archives/001841.html

Lancashire, J., (2006) Ultraversity exit survey, semi-structured interview.

Laurillard D (2002) Rethinking University Teaching: a framework for the effective use of educational technology (2nd edition) London; RoutledgeFalmer (0-415-25679-)

Papert, S. (1980) Mindstorms: Children, Computers and. Powerful Ideas. New York: Basic Books.

Powell, S. (2004) An enquiry through personal experience into new technology and an alternative approach to MA dissertation. MA Education Dissertation. Anglia Ruskin University.

Winter, R., Parker, J. and Ovens, P. (2003) The patchwork text: a radical re-assessment of coursework assignments. Innovations in Education and Teaching International 40 (2): whole of special issue.

How to represent adaptation in eLearning with IMS Learning Design, Daniel Burgos, Colin Tattersall and Rob Koper Educational Technology Expertise Centre (OTEC) The Open University of The Netherlands