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**A NEW PARADIGM FOR TEACHER EDUCATION:
SUPPORTED, OPEN TEACHING AND LEARNING
AT THE OPEN UNIVERSITY, UK**

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Research Group on International Developments in
Teacher Education across Societies and Cultures (RITES)

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In this paper we draw on our experience over the last twelve years with three large scale distance education programmes for UK teachers to suggest factors which need to be considered by those embarking on large scale distance learning teacher education programmes. We focus on three programmes: a pre-service programme in initial teacher education, the Postgraduate Certificate in Education (PGCE); and two in-service programmes, the Learning Schools Programme (LSP) and TeachandLearn.net. which have made been significant in promoting access, entitlement and diversity. We suggest that in each case the programme structure and design was influenced by the interplay of a number of factors: the nature of teacher professionalism; current policies and priorities; financial constructs; technological tools and the regulatory framework. A number of themes emerge from analysis of participant data together with evaluation evidence back from institutions and individuals participating in these programmes. These can be identified as: (1) linear versus modular structures; (2) the importance of broking between the university and the school settings; (3) interactions of programme elements; (4) the role played by contemporary forms of ICTs. We draw together our experiences and research data for these programmes to suggest characteristics of the next generation of teacher education programmes.

Introduction

Since 1994 the Open University's Faculty of Education has been engaged in designing, planning and running large scale open and distance education programmes for teachers: a pre-service programme, the Postgraduate Certificate in Education (PGCE) with an average of 600 student teachers at any one moment; the Learning Schools Programme which delivered training to over 140,000 teachers in UK primary and secondary schools; and TeachandLearn.net, a web-based continuing professional development service launched in 2004 and available to schools across the UK.

The current pre-service programme, the flexible PGCE, was first conceived in 1999 when the relevant national government agency invited proposals to develop a new modular postgraduate teacher training programme (DfEE 1998) in response to concerns over teacher recruitment and retention. The OU PGCE programme thus aims to provide a route to qualified teacher status to those aspiring teachers who are precluded from participating in conventional teacher training programmes by personal

commitments or geographical isolation. It seeks to make a significant contribution to teacher recruitment and to increase social diversity within the teaching profession.

In 1999 the government launched an initiative to raise pupil achievement through funding in-service programmes for teachers to increase their skills in using new technologies in the classroom. Learning Schools Programme was developed by the Open University within the framework of this initiative. It met the entitlement of teachers in schools throughout the UK to engage with new technologies and to gain skills in using such tools to support their own and their pupils' learning. The programme was open to all teachers regardless of their experience and responsibilities, both internal and external to the school environment. .

Rapid changes in social and economic conditions and developments in subject knowledge and pedagogical strategies are requiring teachers to engage in ongoing education and training throughout their careers. Increasingly such engagement is being seen as an essential part of both teacher professionalism and the school improvement agenda. However traditional models of professional learning, centred on 'out-of -school' provision, have limited capacity to meet this increased demand. Financial constraints within schools are also precluding many teachers participating in continuing professional development (CPD) opportunities. Building on the experiences of LSP and the PGCE, the TeachandLearn.net programme presents an alternative model for CPD; offering teachers a range of professional learning opportunities which would not otherwise be available to them for reasons of cost, location, time or other commitments.

All three programmes can be described as 'student centred teacher development' in their design (Stein et al 1990) with an emphasis on practice based learning. Teachers engage in a flexible learning process characterised by:

- Authentic tasks
- Collaboration
- Contextualisation; teachers undertake activities in their environment, - school and classroom.
- Reflective practice.

This article addresses the following questions:

1. What were the design influences on these large scale programmes with their agenda of access, diversity and entitlement?
2. What are the implications for future programme design of the evaluation evidence and data from these programmes ? .

Influences on Design

The planning process involved simultaneous consideration of four programme dimensions: (Hobbs, Moon and Banks 1997)

- *Resources*; type, quantity and mode;
- *Support*; its location, extent, and role;
- *Assessment*; timing and form;
- *Quality Assurance*; monitoring, feedback and evaluation to ensure that quality criteria are maintained through the programme.

From examination of the development planning for each programme we identify five environmental factors which impinged on format of these dimensions for each programme. We suggest that these five factors have particular pertinence when considering open distance programmes with large number of learners; aspects which might be mediated in personal face- to-face interactions need to be made explicit and embedded in supported open learning teacher education courses.

Firstly, the nature of *teacher professionalism* and the role of professional learning within this. Much recent education reform in the UK has challenged aspects of traditional teacher professionalism. Schools and individual teachers must work to an agenda of targets, indicators and extensive assessment whilst curriculum reforms, in particular New Labour's National Strategies for Primary and Secondary Education, have introduced a high degree of prescription in *how* to teach specific topics in the classroom in addition to specifying *what* to teach. In the UK, two recent government driven developments are having a profound influence on the roles and responsibilities of teachers:

- The ‘Children’s Agenda’ based on the ‘Every Child Matters’ Green Paper (DfES 2003) seeks to encourage multi-agency working across education, health and social services in the interests of children and young people.
- Workforce remodelling, based on the 2003 National Agreement on Raising Standards and Tackling Workload, has seen a massive expansion in the number of teaching assistants in schools and changes to the nature of their role. Many administrative tasks have been reallocated from teachers to teaching assistants whilst teaching assistants have become more involved in learning support within the classroom. These reforms are seen by some commentators as blurring the distinction between teachers and teaching assistants.

It has been argued (Sachs 2003) that running through these reforms is a construction of a teacher professional who works efficiently and effectively in meeting standardised criteria for pupils and teachers. There is much discussion over the nature of teacher professionalism resulting from these reforms (Whitty 2006). However there is no doubt that the long series of initiatives and changes to workforce practices are forcing teachers to re-conceptualise who they are and what they do.

For us as programme developers it has been important to understand how professional learning is conceptualised within this new teacher professionalism. In terms of CPD we have observed a move from a wide range of opportunities designed to increase the skills of individual teachers to centrally defined courses around the government initiatives and focused on the needs of the school and its pupils; the PGCE has been characterised by government defined competencies and standards.

Secondly *current policy and priorities* around teachers’ professional learning, teacher supply, recruitment and retention were considered and interpreted. Continued teacher shortage in many areas of the curriculum has accelerated a commitment by government agencies to ensuring that teachers represent the communities within which they work. To achieve this strategies to widen participation in the teaching profession have being promoted and support for more flexible approaches to teacher education is available to us from external agencies.

Continuing professional development for teachers has seen an increased profile over recent years in the UK (Storey 2004) and is one of the five main principles of reform of the government five year strategy which guides the national context in which schools in England are planning and working: ‘A major commitment to staff development with high quality support and training to improve assessment, care and teaching.’ (DfES 2004). The driver for much of this professional learning is the needs of the school and its pupils as expressed in school improvement planning and school targets. Thus continuing professional development is now seen to sit at the heart of school improvement and the drive to raise pupil achievement. (DfES 2005). Schools are expected to develop and deliver coherent policies for the professional learning of their staff. (Ofsted 2006). There is a high emphasis on collaborative professional learning activities undertaken in the context of the school or classroom. Leverage is being exerted on teachers to participate through linking their professional learning to performance management, career progression and thus to remuneration, ‘the biggest rewards to those who..... continually develop own expertise and who help to develop expertise in other teachers’ (DfES 2004).

However fundamental tensions exist in the delivery of these policies: the balance of personal and institutional priorities; sustained activities against meeting short term needs and targets; professional learning as a personal processes or a form of social enquiry. The challenge for the TeachandLearn programme designers was to position our courses within these different fields to ensure successful take-up of the programmes. We needed to include areas of study which were attractive to the purchasers of the programme, the school, whilst also enabling all teachers within the institution to explore issues and areas for their own personal development.

Financial conceptualisation of the programme is key in determining the balance in resource allocation between the different dimensions of materials, support, assessment and quality assurance. Traditionally open distance learning programmes have demanded extensive expenditure in the initial stages to develop resources and an infrastructure for support. Each of the three programmes discussed in this paper have different funding mechanisms and Quality Assurance arrangements:

Table i: Funding approaches and Quality Assurance arrangement

Flexible PGCE Programme	Fixed funding per student recruited by central government with heavy penalties imposed as a result of adverse inspection against identified quality criteria
Learning School Programme	Grant funding and student generated income. Some external quality assurance.
TeachandLearn.net	Income generated by school subscription. Largely University based quality assurance

Exploitation of new technologies enabled us to dramatically reduce the time for production of materials and therefore costs. However the timescales for a successful innovative programme or feature to become embedded within the teacher education landscape remain considerable. Persuading funding bodies, whether external or internal to the university, to remain loyal to such programmes during this extended period has been a continual challenge.

Fourthly, we looked at the set of *technological tools* available to teachers to support their learning during the proposed lifetime of the project. The last ten years has seen a massive investment in new technologies within schools with emphasis shifting from provision of hardware and connectivity to ‘harnessing’ these tools to support learning, particularly pupil learning. How then, can these new technologies (including mobile technologies) be exploited to support teachers’ learning? What levels of proficiency and access can be assumed? Are there tools where the investment required to acquire familiarity with the tool outweigh the perceived benefits to teachers in terms of their learning? Is there an existing infrastructure and capacity to support the use of these tools in a large scale programme? And most importantly which tools (or mix of tools) are most appropriate to provide access to distributed knowledge which previously has been inaccessible due to time and cost constraints? Such questions informed our design of the web environment and choice of tools within it.

Finally, the relevant external *regulatory framework* is considered. The importance of such a framework varies with the purpose of the programme. Such regulations are subject to frequent review and revision by governments as political priorities shift but programmes, whilst operating within the current frameworks, need to be sufficiently flexible to adapt to such changes. For the PGCE programme these criteria provide a procedural base for government agency inspection of the PGCE programme. Continuing professional development programmes in receipt of government funding, such as LSP, are also subject to regulatory criteria. The professional standards framework at different stages of a teacher's career; Qualified Teacher Status, Induction, Threshold, Advanced Skills Teacher and Excellent Teacher act as a background influence across all the programmes; straddling an uneasy tension between acting as a tool for guiding professional learning and as an instrument for assessment of teacher competence.

The role of the university has been to develop quality open learning systems to scale to meet the demands of developing, maintaining and progressing teacher professionalism within this environment and constraints. This has demanded a re-thinking of the shape and construction of content, learning support and assessment such that these programmes are open, flexible, personalised, centred around collaborative school-based learning and acknowledge the affordances of new technologies.

Design Features of Open University Teacher Education Programmes:

Influenced by the environmental factors described above the three Open University programmes offer very different types of courses for different purposes but share a commitment to access and entitlement at scale and the following features:

Resources

- Learning activities managed into accessible smaller 'chunks' that can be knitted together in different pathways to meet personal needs, by teachers in their own context and at different stages of their careers:
- Content organised principally through 'subjects';

- Regularly updated to reflect and respond to initiatives, research and current events; allowing immediate responses to changes in external environment and to reflect the immediate concerns of practitioners.
- Interactivity to optimise learning styles.

Assessment

- Process of assessing learning outcomes driven by application to work.

Support

- E-elements and online communities able to be blended with those sited in the school by school -based mentors, leaders, managers or tutors. (Support for those in such a broker role.)
- Access to external specialist expertise and support

Quality Assurance

- Systems which take account of the special characteristics of such large scale distance programmes.

The Flexible PGCE

The dominant influence on this course has been the relevant regulatory framework but within this new policies to support teacher recruitment from across the community allowed us to explore a less rigid and more personalised design. The modular specification developed by the Open University team contained the following elements:

- A Needs Analysis;
- An individual training plan resulting from the needs analysis and recognizing prior learning.
- Self-standing modules with clearly defined outcomes in relation to the Qualified Teacher Standards [...] with associated assessment.
- Flexibility for trainees to combine modules in different orders;
- Flexible start and finish and assessment times with full and part time options;
- Training closely linked to school experience;
- Guidance and support in relation to progress against the training plan and towards the QTS standards;
- A final synoptic assessment.

The flexible entry and exit points enable student teachers to adopt variable study patterns throughout the course as appropriate; sometimes full-time – sometimes part-time. Within a total time limit of 36 months student teachers, together with their Open University tutor and school-based mentor, negotiate study patterns that meet their own personal circumstances and which enable them to satisfy existing personal, domestic and professional commitments.

With an average age of 35 years and with over 70% of our trainees remaining in either full or part-time employment during their programme, the Open University PGCE has been able to make a significant contribution to widening participation in the teacher workforce. Table i shows a comparison between the Open University course, other courses in initial teacher education and employment-based routes to teacher qualification.

Table i An analysis of students by gender and age.

	All HEI-based routes to QTS	Open University PGCE	Employment-based routes
Gender (female)	74%	60%	66%
Age (35 an over)	21%	66%	50%

Information gathered by the University (Bird and Hutchinson, 2004) at the point of application is helpful in illustrating why this might be the case. 77% of applicants identified the ‘ability to study in your own time’ to be very important. The opportunity to study at a distance is considered by 56% to be very important and the flexibility provided by local school placement is considered to be important for 61% of applicants. When the programme was planned it was anticipated that many applicants would be attracted by the part-time nature of the course. 52% of applicants state that this is very important, but for 36% the full-time option, with the ability to complete within a year was very important. It appears that for most of our student teachers; many of whom have domestic or personal commitments or are still in part-time or

full-time employment attending a conventional face to face course in initial teacher education is not possible.

It is significant that 51% applicants to the OU PGCE had not considered applying for any other PGCE course. This is in line with the national inspectorate (Ofsted 2003) finding that,

Overall, the flexibility to structure a course around other commitments, such as family needs or a career change, was a significant factor for a substantial number of trainees who would not otherwise have been able to train as a teacher.

An important element of this provision is the availability of individualised training routes which take account of previous experience, enabling students with appropriate prior experience to follow shorter courses of training, or to follow an assessment only route to Qualified Teacher Status. This aspect of the training was considered very important by 58% of applicants to date, and many applications have come from mature applicants who have experience of teaching overseas, of working as unqualified teachers in the UK, or of working in schools in other capacities. Evidence gathered from the Needs Analysis process shows that a third of students accepted onto the course are not required to complete the full course.

All students on the pre-service course undertake a Needs Analysis process which identifies the extent to which they are exempt from training elements on the course; students allocated to Route 1 complete the full course; Route two students are exempt from the first level of the course; Route three students are exempt from the first two levels of the course and Route four students are presented for 'Assessment Only'.

These three key features: flexible start and finish points; individualised routes which contain an element of course exemption; and local and flexible training which takes into account personal and professional needs, are, we suggest, responsible for the PGCE Programme's success in recruiting greater numbers of male student teachers, greater numbers of mature entrants to the profession and greater numbers of student from minority ethnic backgrounds than is the case with other national providers.

Learning Schools Programme

The 'Learning Schools Programme', a consortium of the Open University and Research Machines, was one of around fifty training providers approved to deliver teacher training in the use of new technologies to support learning. It was the only provider to operate across the whole of the UK and became the largest single provider in the UK.

Within the Learning Schools Programme, the easy availability of new technologies was crucial to the design of the project. Thus in addition to provision of conventional distance education printed materials, the programme supported learning through the innovative use of CD ROMs, videos and web exemplars which deployed a rich mixture of text, graphics and audio and video clips. Versioned materials were produced for the four nations of the UK, (including Welsh language items) to support teachers in their own environment and extensive use was made of large scale on-line conferences to promote professional dialogue with moderators from within the Open University team. Adequate central government financial support for the initiative enabled face to face support to be provided through the extensive network of partners at school and local authority level.

Whilst schools were free to choose more than one provider, most opted for just one, especially in the primary sector and the programme design catered for both institution and personal needs and development. The programme participants received practical guidance in identifying their own needs and plotting individual pathways through the materials.

The Learning Schools Programme through its combination of local support, versioned materials in a mix of formats and professional discussion in the virtual conferences provided access to training in the classroom use of new technologies for significant numbers of in-service teachers.

Table ii shows the total number of teacher bookings on the Learning Schools Programme was 144,448.

Teacher Bookings on Learning Schools Programme 1999-2003								
Country			Year					Total
			2003	2002	2001	2000	1999	
England	Phase	Primary	4	9,427	24,809	16,037	330	50,607
		Secondary	47	11,676	21,905	16,619	375	50,622
	Total		51	21,103	46,714	32,656	705	101,229
N Ireland	Phase	Primary		2,934	3,696	570	4	7,204
		Secondary		3,096	4,700	1,115	0	8,911
	Total			6,030	8,396	1,685	4	16,115
Scotland	Phase	Primary	4	1,854	1,800	1,123	180	4,961
		Secondary	0	2,336	2,920	1,138	147	6,541
	Total		4	4,190	4,720	2,261	327	11,502
Wales	Phase	Primary	1	1,539	3,676	2,370	41	7,627
		Secondary	0	1,665	3,642	2,645	23	7,975
	Total		1	3,204	7,318	5,015	64	15,602
All UK	Grand Total		56	34,527	67,148	41,617	1,100	144,448

TeachandLearn.net

Financial constraints within schools, limited capacity of traditional out-of-school models of professional learning to meet increased demand, increased availability of fast internet access both in schools and privately and the increased emphasis on directly supporting work in the classroom drove the design of this flexible service.

Teachandlearn is a wholly online environment; there are no accompanying paper, DVD or video materials or face-to-face support. . The ICT skills required to successfully use the site are well within expected skill set of each teacher / teaching assistant in an e-confident school. (NCSL 2005). Design of the service as an institutional tool reflects the recent emphasis on collective collaborative CPD within an institution. Subscribing schools are encouraged to adopt a structured approach to integration of TeachandLearn.net within their CPD plans. The element of customisation speaks to teachers' professional identities as, for example, secondary Geography teachers or primary specialists.

For a programme such as TeachandLearn.net, reliant on institutional subscription income, the programme needed to be priced realistically within school budgets and to have the potential to appeal to school needs. Financial constraints within schools preclude many teachers from engaging in professional learning during the school day and at any great distance from the school. Our programme therefore needed to be able to be studied flexibly and support was provided through virtual conferences with a team of Curriculum Advisers.

The core of the programme is 280 study units; each a self-standing module of 6 – 8 hours of study with clear learning outcomes. Users are able to create their own personally 'owned' route through these units, or sections of the units, from multiple entry points. Drawing on the model developed by Banks, Leach and Moon (1998) the units are organised into subjects and subdivided into subject knowledge and pedagogic knowledge. Content within each study unit is drawn from a wide range of sources, research and professional journals, conferences, case studies etc, and media – video, audio clips, text, images and animations - to liberate insights and provide a springboard for experimentation and dialogue within the teacher's school and classroom. The professional development activities in each study unit centre on classroom research and reflection, extending the professional's role in innovation.

Several authors are used within each subject areas to offer a range of perspectives and voices. The range of study materials is appropriate for users with diverse levels of knowledge and experience. Augmenting this formal reporting of other people's

experiences are the online asynchronous conferences for informal, social learning through peer dialogue.

Complementing the study units are a range of additional resources; e-lectures, summaries of current research projects from colleagues at the Open University, and articles from educationalists and education journalists. Tools to assist learning include personalisation, an online notebook, access to a number of online conferences and templates for recording learning.

Whilst still in its early stages, the T&L programme can claim some success in creating a programme to scale and providing equity of access to a wide number of professional learning activities to staff in schools across the UK; primary, secondary, special, rural and urban. To date 4000 teachers have accessed the programme attracting over 2 million hits. Analysis of the user data reveals parity of use between the pedagogically focussed study units and those centred on subject knowledge. The findings of recent surveys of CPD (Wellcome 2005) indicated that many teachers had not engaged in subject specific CPD in the past 2 – 3 years. We might then very tentatively suggest that the T&L programme enabled teachers to participate in areas of professional study that we not normally available to them.

Emerging issues

During the production and presentation of these three courses in pre-service and in-service teacher education, the following issues have emerged:

- Linear versus modular structures;
- The importance of brokerage between the university and the school settings;
- Interactions of programme elements;
- The role played by contemporary forms of ICTs.

Linear versus modular structures

The specification for flexible PGCE programmes insists that they are ‘modular’ in nature. Similarly key players within schools have been initially attracted to the

potential of both LSP and T&L to offer teachers an individual learning experience, ‘finding your own path rather than a prescriptive course’. However in both cases the lack of clearly identified ‘routeways’ within the materials has been problematic for many users. The LSP team added ‘Pathways’ through the modular materials to assist teachers in navigating their way through the programme and a desire for ‘optional/ optimal routes’ defined by the Open University in the TeachandLearn programme has been suggested by several schools. Evaluative data gathered by the TeachandLearn programme show that it has been most successful where schools adopt a linear approach to study – working collaboratively on a small sequence of study units. The flexibility in start dates in these programmes has meant it has been difficult to establish vibrant dialogue in the online conferences; teachers are rarely experiencing simultaneously similar issues and problems.

We observe the desire to personalise the learning experience, and the importance of the personalised experience for students, is in tension with a linear, collaborative approach. Within an award bearing course such as the PGCE it appears that the advantages of personal flexibility offered by modularisation are overriding. Whilst within the more open in-service programmes there appears to be a need to work within the existing culture of ‘courses’ associated with continuity and progression of learning and support of a wider community undergoing similar experiences at the same time. The challenge for us to provide optimal routes as exemplars, not prescriptions, and to preserve the flexibility and ability for the materials to be adapted and knitted together into a variety of routes.

The importance of mediation between the university and school settings

We have found the role of ‘broker’ between the University and the school setting to be a critically important aspect of the successful operation of these programmes. The nature of this role, however, differs between the programmes and this is primarily due to the funding framework associated with each programme and external quality assurance arrangements. The PGCE programme, for example, employs part-time subject specialist tutors who work with students on their university-based study and who visit the student in schools. One of the primary tasks during the school visits is to make links between the modular study and to school experience. The feedback offered

by university tutors is thus qualitatively different from the feedback offered by school-based mentors who focus on contextual issues. The tutor acts as a broker between the university and the school setting.

On the other hand, TeachandLearn.net, as a subscription based service with lower levels of direct income operates without the benefit of university based tutors who visit schools: it relies on other forms of 'brokerage'. We have found that strong 'ownership' of the programme by a key individual within the institution is a characteristic of all schools with high levels of usage of this programme. Such individuals generally hold roles within the school senior management team and leadership of CPD is within their portfolio of responsibilities. They have actively managed the implementation and integration of professional interactions with T&L into the school CPD plan; identifying routes through resources for colleagues and establishing, structuring and supporting the working of small learning groups studying a set of units. These 'champions' have supported the development of in-house expertise in 'how best to work with the material' and dissemination of this through the school community. Future work on the project will encompass how such 'brokers' supporting work across the university / school boundaries can best be supported.

Whilst many of these 'brokers' are positive about the benefits of school based CPD, supported by online learning many have stressed the accountability dimension of their role particularly in the context of school self-evaluation, and a desire to be able to monitor usage across their staff 'which staff had used and for how long'.

The dynamic interactions of programme elements (support, resources, quality assurance and assessment)

Each of the three programmes illustrate different ways of configuring support, resources, quality assurance and assessment. The PGCE Programme has heavy emphasis on central control and Quality Assurance, dominated by external inspection processes maintains a balance between these four dimensions, whereas the Learning Schools Programme and TeachandLearn focus more on the provision of resources and less on assessment and support. It seems likely that the role of universities and in

particular the role of the Open University will change quite radically over the coming years; perhaps generating and seeding quality assured material for the open content movement with income largely generated through the provision of support and assessment. The Learning Schools Programme and TeachandLearn took significant steps towards this future, with the provision of high quality materials and with support networks largely provided by subscribers themselves.

The role played by contemporary forms of ICTs

Each of the three programmes has illustrated the way in which new technologies are facilitate large scale engagement in both pre-service and in-service teacher education; featuring in the areas of support (online conferences) and resource provision through digital content.

We still appear, however, to be in the early stages of e-revolution, with many Teachand Learn subscribing schools reportedly regarding face-to-face and online experiences as alternative modes of learning. Face-to-face opportunities are frequently referred to as the preferred option with reluctance from many staff to engage with online activities for their own learning. We have encountered some examples of online resources and activity being integrated with workshops and other face-to-face events and this 'blended' approach appears to have worked well.

Perhaps the most significant development in the use of ICTs to support pre-service and in-service teacher education is yet to come. The final section of this paper speculates on the application of the next generation of web-based tools to teacher education.

Developing the paradigm

The last ten years have seen an immense leap in the sophistication and availability of easy to use web based tools; the web has moved forward from merely enabling access to knowledge to becoming an enabling presence threaded through our environment. We have seen the rapid growth of enabling tools such as Wikipedia where the collective intelligence of users is harnessed and users act as co-developers.

With the advent of open content, increased connectivity and availability of web-based tools to generate and share content, we needed to re-consider the balance of this conventional split. Should a larger proportion of the available resource be allocated to updating the content and providing a higher level of professional support throughout the lifetime of the programme?

Our view is that this enabling view of technology is congruent with social theories of learning and has the potential to support such models of learning and we anticipate a significant increase in social learning activity. Application of a combination of these new web tools, increased availability of open content together with user data from our current programmes leads us to consider that the next step will be to build on current frameworks to include provision of tools for learning for communities in which content resides; the teachers' workplace, the school and classroom.

We argue that universities need to quickly reposition themselves in order to participate in the learning opportunities which will be enabled through technological advances in the 21st Century. It is likely that the role of the university within teacher education will move from the provision of packaged pre-selected content to provision of tools which underpin and support a distributed, decentralised network with cost-effective scalability; from content producer to community builder. Universities in such a paradigm would provide quality assurance over the content which is seeded, modified, adapted and developed. With opportunities for learners to engage as academics, University members of academic staff would become 'academic coaches', removing the now significant distinction between teaching and learning.

For example, within an environment such as TeachandLearn.net, the emphasis shifts from presentation of collections of resources and materials with associated activities to support for collaborative experimentation and space for dialogue around such university invited school-based activity. Core content would continue to be provided in the current small 'chunks' but integrated tools would enable learners to augment and enhance such content as they engaged. Virtual conferences would move to be located within supported specific communities.

A critical step along this path has been taken with the Open University's Open Content Initiative; in addition to providing learning resources 'freely' to all users, the 'lab space' includes a set of 'sense making' tools to facilitate the modification, use and re-publication of content within a community of content builders. (OCI)

This new paradigm for teacher education and development entails a huge cultural shift within the profession and institutions. Hopeful signs are the emphasis on lifelong learning, the role of employers within the expansion of universities and the drivers of school based professional development to support school improvement..