Find it, make it, use it, share it: learning in digital Wales

Digital Classroom Teaching Task and Finish Group
Janet Hayward (Chair)

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Further information

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Chair's introduction

In September 2011 the Minister for Education and Skills, Leighton Andrews AM, set up an external task and finish group to consider 'which digital classroom delivery aspects should be adopted to transform learning and teaching' for those aged 3–19.

In particular, the group was asked to consider:

- how high-quality, accessible digital classroom content could be developed

- how National Grid for Learning (NGfL) Cymru was used, and whether there was a more effective way to deliver its aims

- whether and how a cloud-based content delivery system (e.g. the 'iTunes university' model) would work alongside an online learning platform for Wales

- how high-quality English- and Welsh-language content could be generated

- how to develop Welsh intellectual property which can be used to deliver digital teaching content

- how teachers might get the digital teaching skills to use ICT to transform schools.

The group was also asked to identify the implications for funding, planning and governance of services arising from these points.

The group carried out its work in a series of meetings and digital communications between November 2011 and February 2012. It heard from invited presenters and considered written responses by teachers and others to an invitation to submit views on the subject.

The names of the group's members are listed in Appendix 1. A list of presenters and consultation respondents can be found in Appendix 2.

This is the group's report. It sets out what we think the Welsh Government and many others should do to introduce, embed and promote the use of digital technologies to enhance learning and teaching. We believe strongly that digital technologies, combined with sound pedagogy, have the potential to make a substantial difference to the quality of learning and to the overall performance of learning providers.

We have used the term 'learning providers' to refer to schools and all other institutions serving the learning needs of those aged 3–19. Other terms and abbreviations are explained in Appendix 6.

Janet Hayward
Chair

Our vision

"Learning throughout the world is standing at a very interesting crossroads and this is in the main to do with the ubiquity of access to information anywhere in the globe. The information accessible to educators and learners is vast and the potential to collaborate, co-construct and learn with others has never been so great. As a nation Wales must harness this vast open learning potential and put in place some of the necessary principles, frameworks and processes to tap into this in order to ensure a place at the 'top' table of learning futures but more importantly to equip its educators and young people for the exciting and creative challenges that lie ahead.

In such a world learning will be more dynamic and we need to switch our learners and ourselves on to this by understanding that the ability to learn and use new skills and technologies in a collaborative way will be key to the future."

John Putt, Headteacher, Holywell High School

Our vision is to create a first-class 'hub' – both an environment and an interconnected organisational structure – representing the best in digital learning and teaching.

This hub, available to all teachers and learners in Wales, will provide the culture, support, infrastructure and resources to inspire teachers and learners to develop what they need – the vision, competencies, skills and knowledge – to be creators and active participants in the fast-changing digital landscape around us. It will help improve educational standards, prepare learners for life and careers, and support the Welsh economy.

Our starting point for this vision is the belief that teachers and learners now live in a world where communication and knowledge are routinely digital, ubiquitous and highly interactive, and that the processes of learning and teaching can, and must, take advantage of what digital technologies offer.

We have developed a number of key requirements that we regard as essential to success:

- a national, all-Wales approach to planning, with a national body at its heart, in harmony with the Welsh Government's Digital Wales agenda

- the ready sharing of skills, methods and resources between teachers and learners

- equal access to all resources for all teachers and learners

- a 'national collection' of digital resources, derived from multiple sources and accessed by multiple channels

- consistent treatment of intellectual property rights in the resources provided

- establishment of a high level of digital competence (in digital technologies, information literacy and digital citizenship) in teachers and learners.

The use of digital technologies and resources needs to change from being sporadic and patchy to being ubiquitous and taken for granted in education throughout Wales. Only by working at an all-Wales level will it be possible to give universal and consistent support to teachers and learners and provide the organisational structures and culture that will allow them to create, discover and promote sound pedagogic use of digital resources and technologies for learning and teaching.

We see the need for national action in two main areas:

- encouraging, supporting and preparing teachers to operate in a digital environment and, crucially, to share their digital practice (Theme 1)

- establishing and developing a system and a national collection for creating, storing and sharing digital learning resources (Theme 2).

To pursue these we see the need to set up a new and powerful national body. Our provisional name for this is 'Hwb'. This conveys both themes: in Welsh 'Hwb' means 'a push' or 'spur' (Theme 1), and what we propose will act as the 'hub' for sharing and using digital resources (Theme 2).

Sharing is a central and essential concept: the success of what we propose, and the success of Hwb as a body, will depend in large measure on the extent to which teachers and learners participate and share ideas, methods and resources.

Headline recommendations

1. Establish a powerful organisation (working title 'Hwb') to manage, oversee and develop these recommendations. Its remit will be to lead, promote and support the use of digital resources and technologies by learners and teachers, and create and develop a national digital collection for learning and teaching in English and Welsh.

2. Establish a group, including representations from existing practitioners, as well as other bodies both public and private, to govern the implementation of these recommendations.

3. Ensure that a substantial difference is made to educators' digital competencies and skills, and how they apply them to learning and teaching, by prioritising training and sharing good practice.

4. A national digital collection should be created by acquiring English- and Welsh-language resources through commissioning, purchasing, obtaining licenses, and also through actively encouraging contributions from learners and teachers.

5. Give all users their own individual logon ID, potentially for a lifetime of learning. This will take them into their personalised user experience and will be accessed from anywhere.

6. Ensure that learners and teachers have the freedom to access rich learning and teaching resources from anywhere, at any time and from any device.

7. Manage intellectual property rights in learning and teaching resources to ensure maximum access by learners and teachers and create income from external licensing.

8. Commission new resources in English and Welsh and procure national licences for existing materials and tools, to ensure economies of scale when building the national digital collection.

9. Use existing tried and tested web-based products and services to disseminate existing and new content.

10. Ensure that a culture of digital citizenship is encouraged and developed by learners and teachers. In addition to key digital skills, this will help learners develop the competencies and values to use digital technologies responsibly, ethically and safely, with an understanding of the security and legal issues surrounding the 'digital space'.

Explanations of these recommendations, along with a series of more detailed recommendations, are given in the following three sections. All of our recommendations are listed in Appendix 2.

Theme 1: Supporting and sharing

Hwb will be the organisational centre of the new digital learning system for Wales, but its cultural and creative engine will be teachers. They will be crucial not only in delivering technology-enhanced teaching and promoting digital learning resources, but also in creating resources, sharing them with other teachers and helping to develop the entire digital learning climate.

Supporting teachers

Setting the vision and providing the necessary training and support for all users of the hub will be fundamental to its success.

As teachers and learners are encouraged to become active participants of the hub it is imperative that we set out a benchmark of the **digital competencies** and support needed by teachers, who will be supported to develop these competencies.

These digital competencies will ensure that teachers have a better understanding of digital technologies, and the necessary skills and knowledge to use these proficiently to create better learning experiences. They are of three main kinds (with some overlap).

- **Digital technologies:** an understanding of existing and emerging digital technologies and how they can be used innovatively and effectively to enhance learning. This should also include an understanding of the internet and convergence of internet services.

- **Information literacy:** how to search effectively, how to organise content found, how to evaluate online content, how to reference or attribute an online source, how to source 'legal-to-use' media. The Welsh Information Literacy Project has published a framework for the development of information literacy.

- **Digital citizenship:** an understanding of the potential risks digital technologies present and how to manage them; for example, how new apps and services can affect issues of privacy, identity and reputation online, how social network sites can blur public and private boundaries, and how personal data can be misused; an understanding of legislation on misuse of the internet, such as cyber-bullying, texting and libel; an understanding of best practice in promoting responsible, ethical and safe use of digital technologies and what support structures need to be in place to achieve this.

The teaching of these core digital competencies should be included in initial teacher training (ITT) for all new teachers and learning support assistants, using clearly defined standards. They should form a compulsory module of the new Masters qualification for teachers.

A technology for learning and teaching module should be included on the NPQH (National Professional Qualification for Headship) course for schools and/or the MA Leadership and Management (Further Education) delivered by ColegauCymru for further education (FE). This should emphasise the benefits offered by the appropriate and effective use of digital technology, for administration and organisation as well as curriculum. Learners will also learn how to develop a technology vision across their own institutions, based on the ICT Self Review Framework.

All existing teachers and support staff will work towards gaining digital competencies through a blend of online courses and face-to-face regional/consortia networking. Relevant targets should be set in performance management, along with an appropriate timescale to achieve the competencies.

All teachers in Wales will be encouraged to become members of a relevant national body specialising in technology for learning and teaching, for example Naace or ALT (Association of Learning Technology), allowing them access to support the networks and resources of those groups.

e-Coordinators will exist within each learning provider. They will meet to share practice together across school clusters, and will collaborate regularly with colleagues nationally to share good practice.

A team of **local officers** will be attached to the Hwb team. Each will work within a consortia region (collaborating with Information and Learning Technology (ILT) Managers in FE). Their role will include:

• liaising with the e-Coordinators and ILT Managers within each learning provider

• demonstrating the benefits and functionality of the hub to all users

• acting as moderators and contributors to national online forums

• working with learning providers and teachers to create their own digital learning and teaching materials and publishing them in the digital collection

- highlighting good practice in consortia institutions and sharing this through the national online forums. For example, through iTunes U, through consortia (regional) e-Coordinator meetings, consortia (regional)-based digital learning and teaching conferences, and at an annual Welsh Digital Learning and Teaching Conference.

Teachers will be encouraged to take advantage of specific means of communicating and sharing ideas. These may include:

- the TeachMeet method of sharing good practice between practitioners

- an agreed national Twitter hash-tag (#) for sharing information and good practice examples from around Wales and the world

- the use of Google+ hangouts to share practice and information across and beyond Wales

- national online collaborative forums to share good practice, discuss effective learning and teaching approaches and look at new technologies. Learning platform local officers, ILT Managers and e-Coordinators will keep the forums active and alive with regular postings

- the continued use of professional learning communities to support and share practice between teachers

- a learning platform help desk and FAQ area supporting all users of the new learning and teaching portal (via e-mail, telephone, video conference and social networks)

- strong, active and coordinated support at a local or consortia (regional) level promoting the effective and appropriate use of technology to support learning and teaching in their region.

Recommendations

- Define a set of standard digital competencies needed by teachers to participate fully in the hub, and a range of digital technology applications to enhance learning.

- Include the teaching of digital competencies and applications in initial teacher training, postgraduate and other programmes, and in continuing professional development.

- Encourage teachers to become members of Naace or ALT.

- Establish e-Coordinators in each learning provider, and a network of local Hwb officers to coordinate activities at a consortium level.

- Use a variety of means to encourage teachers to support one another and share good practice, including an annual Welsh Digital Learning and Teaching Conference.

Sharing skills and resources

Sharing skills and resources will be critical to the success of the hub. Ideally this should happen at a national scale, so that the benefits of innovation can be disseminated as widely as possible.

Teachers should be able to upload their resources for comment and advice from colleagues, making them available copyright-free under a liberal Creative Commons-type licence. These 'beta' resources could then be used as a test bed for the development of 'alpha' resources for and by teachers and educationalists. Hwb could then adopt the resources and publish them in the digital collection for access by all learners.

Success in this 'adopt-and-publish' process could be seen as a 'badge of pride and honour' in itself or could also be used to feed into performance management and continuing professional development portfolios.

A national teaching award could be developed for the best content submitted to the digital collection, voted by fellow teachers. This should be part of a wider celebration of excellent pedagogy and build upon existing awards.

Subject-based digital resources created during initial teacher training, resources produced as part of Schools Effectiveness Grant and Welsh in Education grant projects, and those produced by professional learning communities, should be presented to Hwb for possible inclusion in the digital collection.

Performance management and continuing professional development activities may result in digital resources or ideas that could be contributed to the hub and the digital collection. The existing additional INSET days could be used to develop the level of digital skills, with training led by the e-Coordinators who could conduct workshops to enhance existing lessons.

The emphasis should be on how digital resources enrich the pedagogy, winning hearts and minds by showing how actual lessons in the hands of teachers could be developed through digital resources and avoiding abstract theorising.

Time is the crucial factor in ensuring that good-quality material is developed, therefore funding should be found to allow e-Coordinators to be released from learning providers to share their expertise and capture material to be uploaded and shared. Bursaries could be for blocks of time, e.g. a term or a day or two-day release. Such a scheme should be dynamic and allow for continuous change in personnel to maintain a freshness and contemporary element to the arrangement.

Use should be made of a revised ICT Self Review Framework and the UNESCO ICT Competency Framework for Teachers. The success criteria for institutions should consist of positive engagement with the hub with long-term sharing of high-quality resources through the digital collection.

To encourage open discussion and professional dialogue on what constitutes good learning and teaching, existing events and social network sites should be used, or new networks established, and the Hwb portal itself should host a networking facility.

An area within the Hwb portal will be reserved to show and share best practice cases in a way that conforms with Estyn inspectors' expectations. Estyn and others could also signpost such practice as part of their continuous monitoring and evaluation role.

An 'educational hub' model of training should be developed, where learning providers offer themselves as beacons of good practice and engage with other institutions to develop training and showcase good examples. These hubs could then feed into the Hwb portal or provide the training on a regional basis. Partnerships and creative collaborations should be formed to commission new content, but within a single nationally led programme that responds to the standards agenda set by the Minister.

Learners too should be encouraged to share ideas and digital resources. An element of the portal site should be established specifically for them and should be aligned with learner voice. At secondary school, for instance, the Welsh Baccalaureate could be used to encourage peer-led support and guidance.

Learners could develop their own self-help study and learning guides and upload them on platforms such as video-sharing sites, as practised by the Khan Academy. Learner conferences run by learners for learners could be held to showcase the best of the uploaded resources – regional and national – as part of the learner voice engagement in learning. Learners could also mark or assess the resources, award prizes and celebrate good and effective work.

Recommendations

- Establish a system whereby teachers may expose their own resources to peer review, and if successful see them adopted and published by Hwb in the digital collection.

- Arrange for digital tools and resources created as a product of teachers' education, training, professional development, INSET days and performance management to be uploaded.

- Fund e-Coordinators to be released from learning providers to share their expertise with colleagues and capture material to be uploaded and shared.

- Highlight and share best practice through reference to Estyn, events and networking services, and partnerships.

- Establish a space for learners on the Hwb portal so that they can share their own digital resources, and encourage them to promote best practice through assessment, awards and other means.

Theme 2: A national digital collection

Our vision is to create a national collection of digital resources for learning and teaching in all Welsh learning providers.

The collection will reflect whole new ways of learning and teaching. Rather than being simple didactic carriers of information, many resources will be interactive and participative: many of them will be interactive in themselves (and therefore useful for the skills they demand), and most, whether static or interactive, will welcome online sharing, reaction, feedback, rating and tagging, by teachers and learners.

There will be many different kinds of producers: commercial publishers, public bodies and, crucially, teachers and learners themselves.

Resources will reach the collection by different routes: purchasing, commissioning, licensing and voluntary, peer-to-peer sharing.

The kinds of resource in the collection will vary greatly. They will include e-books, teaching packages, moving image and sound resources, software tools and apps (preferably using open-source), learning materials including primary sources, and professional help for teachers including e-periodicals and research material.

In effect the collection will bring into being for the first time in Wales:

- a huge national online library of learning resources

- a central bank of tools, software and apps available to everyone

- a service offering training, support and advice in creating and using digital resources for learning and teaching.

The collection will contribute to better educational outcomes by:

- spreading good practice in digital-based learning ('Find it, make it, use it, share it'), and supporting new ways of learning and teaching

- increasing substantially the number and range of learning resources available

- making more efficient use of the funds available in Wales for learning resources

- encouraging media and methods that suit the learning preferences of contemporary learners

- promoting interactivity and reflexivity in learning in place of 'chalk and talk'

- ensuring high quality and reliability in resources, and legality in their use.

The collection will have the following features.

- It will include material derived from four different kinds of source.

- All teachers and learners will enjoy free online access to it, in school and at home, using a variety of technical platforms.

- Its contents will be continually validated as authoritative and of high quality.

- Resources will be bilingual, as far as is practicable.

- They will have been cleared for intellectual property rights.

- They will also have been catalogued, stored and made available in the most effective way.

- They will need to be maintained and updated so that they continue to be relevant.

Each of these features is explained in turn below.

What will be included in the collection?

The collection will contain – or rather, in most cases, point to – resources originating from four different sources:

- resources created or commissioned by the Welsh Government and its agencies

- resources licensed or bought by the Welsh Government for use by teachers and learners in Wales

- resources made available by 'trusted sources'

- resources created by teachers and learners themselves.

Resources created or commissioned by the Welsh Government and its agencies

These will be bilingual resources created or commissioned at the request of Hwb with the intention of ensuring the availability of learning and teaching materials that are unlikely to be provided by the commercial market, and to move away from the heavy emphasis on print publication in favour of digital publication.

Hwb will review other resource commissioning schemes for learning providers and if possible amalgamate them with the new system. It will also review and update as necessary the commissioned resources held in NGfL Cymru's existing collection.

In time Hwb will become a significant commissioner of educational resources, joining with co-commissioners and encouraging partnerships between bodies, especially in the public and third sectors, that are looking for a place to publish their digital content.

Hwb will ensure that all commissioned resources are subject to the same open educational licences, so that teachers know that they can use and adapt material for their own pedagogic purposes. It will also be responsible for curating this category of resources, preserving them so that they can be updated and re-used in future.

Recommendations

- Review the current commissioning by the Welsh Government of Welsh-language teaching material (and of any other similar commissioning of educational resources by other agencies), and reform the current system, ensuring a radical shift from analogue to digital medium.

- Prepare a set of standard Creative Commons-type licences to be applied to these resources, thereby encouraging their use and reuse for educational purposes.

- Store and retain these resources in a trusted digital repository.

Resources licensed or bought by the Welsh Government for use in Wales

These will be largely commercial educational digital resources: learning and teaching packages, e-books, software packages and learning materials. Hwb will use Wales' purchasing power to negotiate national licences so that teachers and learners in all learning providers in Wales have free access to them. This might include a national Educational Recording Agency (ERA) licence or a system incorporating ERA+ to enable learning providers to locate and use broadcast material legally and free of charge. Where appropriate, Hwb will buy material outright on behalf of all Welsh learning providers. Teachers should have a substantial voice in the selection of resources to be acquired in this way.

Thanks to JISC, Eduserv and other bodies, national licensing and purchasing of learning resources has been a common and successful practice in higher and further education for many years, at a UK and a Wales level. A similar, unified national purchasing and licensing system will be introduced for Welsh learning providers, with a substantial fund available to Hwb to acquire resources.

The fund could be built in part by pooling funds currently spent locally or regionally within Wales, and from reducing expensive dependence on print resources currently purchased by many different authorities and learning providers.

Recommendations

- Introduce a national licensing and purchasing scheme for learning providers whereby free access to commercial resources can be negotiated at preferential rates.

- Redirect funding from local sources and from print-buying towards all-Wales licensing and purchase of digital resources.

Resources made available by 'trusted sources'

Many public and third sector bodies in Wales and beyond produce learning (and also some teaching) resources, usually available as 'open resources' free on the web. These resources are entirely suitable for use by teachers and learners.

Examples of these bodies include the BBC, the National Library of Wales, the People's Collection Wales and National Museum Wales. Hwb should officially validate, 'badge' and point to them as 'trusted sources', so that teachers and learners are aware of them as valuable and reliable sources of information. It should also work with them, using additional funds if needed, to open up their resources to effective educational exploitation.

This category of material will include a large amount of relevant digitised (as opposed to born-digital) material, and much will be in the Welsh language (including the substantial Welsh-language content of the BBC's 'Jam' digital curriculum and the product of the National Library's mass digitisation programme).

Recommendations

- Hwb should identify suitable digital resource providers and recognise their resources as eligible for inclusion, working with them to ensure educational benefit.

- Hwb should encourage these resource providers to make their resources available to learning providers using its standard licences.

Resources created by teachers and learners themselves

Teachers and learners keen to share their own resources, tools and apps will be strongly encouraged to do so.

Sharing resources in this way will be a critical and innovative feature of the collection, reflecting changes in contemporary educational thinking and practice. The commitment to share echoes the commitment to teach and learn in a collaborative and open way, and prepares learners for the experience of contemporary employment, which calls for inventiveness, interactivity and collaboration in an increasingly digital environment.

Hwb will make it easy to upload and share resources, and help teachers and learners who are newcomers to the process. It will make sure that the technological means of uploading are simple, and that any moderation procedure is as light as possible. It will itself become a centre of expertise in creating apps, software and other tools, often open source, generic ones, like timelines or search engines, that can be used and reused in different subjects and with different materials.

Hwb will also promote technical skills and knowledge among teachers and learners, perhaps through staging competitions or offering bursaries for the development of ideas into products.

Recommendations
- Hwb should encourage teachers and learners to share their own digital resources and tools with others in Wales by uploading them to the collection.
- Hwb should promote the creation of all kinds of digital resources and tools, and the skills needed to produce them.

Note: A vast number of freely available digital resources exist that are of great actual or potential educational value across the whole curriculum – so vast that it will never be practical either to 'badge' them as recommendable material or even to refer to them from within the collection. (However, it should be possible to incorporate a system whereby teachers can alert their peers and learners about relevant sites.)

Instead, teachers and learners alike need to be equipped with the information literacy skills needed to locate these resources, and to determine their value: how to evaluate information resources and their sources, and how to discriminate between reliable and unreliable information (see page 7, Supporting teachers).

Who will have access, and how?

The collection will be freely available to all teachers and learners in all Welsh learning providers. Access will be through the use of a standard national personal authentication procedure. For the learner this will be a simple, single 'log on', giving access to a world of online resources (unless licensing conditions forbid).

Easy access of this kind may have implications for site-blocking rules currently in operation in learning providers.

It also assumes adequate broadband access – sufficient to deliver, for example, sound and moving image and other bandwidth-hungry media and applications. It will be important that, as far as possible, resources are platform-independent, so that learners may access them from a variety of hardware and software environments.

It will be important that the collection is also available outside the learning provider, and in particular from home. Access outside the learning provider will assume that learners have available to them (a) electronic devices appropriate to their purposes and (b) a reliable and adequate internet connection. It cannot be assumed that all of them do have such access. See page 23, External conditions for success, for more details.

Implementation of these recommendations will therefore need to go hand in hand with steps to improve access, at network and device level, in and out of the classroom, throughout Wales.

Many of the resources in the collection will not be restricted to use by teachers and learners belonging to Welsh learning providers; unless, for example, licences disallow it, they will be openly available to anyone wishing to learn, either in a formal setting, such as a college, or less formally. Thus the collection will act as a large public library of resources and tools that anyone interested in learning, whatever their age, background or motivation, will have at their disposal.

Quality validation

Users of the collection, and especially teachers, will need to be assured that the materials it contains come from authoritative sources, are of real quality, that they have been well tested, that they are free of copyright problems and content of a dubious or unsafe nature. Put simply, each suitable resource needs to have a 'kite mark' and a standard set of 'labels' attached to it, so that teachers are able to assess its status quickly and easily.

Another need will be to ensure that resources are as far as possible platform- and device-independent, and that they meet accessibility standards.

This will place a considerable onus on the evaluation methods employed by Hwb, and its ability to keep resources under review. Moderators, skilled in grading and assessing resources from several points of view, will be needed to evaluate them as they arrive at the collection.

However, there is today another powerful, though less formal, means of assessing and reviewing online resources: reaction from users themselves. Amazon, Wikipedia and many other online services rely on this means of attributing quality. The collection will therefore be hospitable to online tagging, peer review and comment, so that teachers and learners can register their views and comments on the quality and utility of individual resources. Experienced and trusted teachers and learners could themselves become moderators.

Bilingual provision

Policies will be needed to determine the basis on which material will be made available in both English and Welsh so that equity in the availability of core material in both languages is established and is accepted as key to the success of Hwb. There will be a continued need for a strong Hwb to stimulate the production of suitable material in the Welsh language, in the absence of commercial supply, taking full advantage of opportunities for co-commissioning. The system's feedback facility will allow teachers to nominate English-language resources they feel most require Welsh translation.

Intellectual property rights

Teachers need to be assured that they and learners can use the materials in the collection in the knowledge that they will not be infringing copyright or related law, and, more positively, they should be encouraged to reuse and repurpose material when licences allow.

All materials in the collection will therefore be labelled, in as simple and comprehensible a way as possible, on the basis of standard licences agreed for each class of material. Creative Commons-type licences should be used for commissioned resources and those contributed by teachers and learners.

Content and tools created for the collection could be licensed to others outside the education sector in Wales – to private schools, to learning providers outside Wales, or more openly – to generate income for reinvestment. Hwb itself could gain from this activity, reinvesting its income, or alternatively the originators could retain intellectual property rights and benefit themselves.

Cataloguing, storage and distribution

All material in the collection will need to be easily found by teachers and learners. Two key requirements, therefore, are excellent metadata to ensure effective retrieval of resources, and a simple but sophisticated user interface.

Each commissioned and community-contributed item will be labelled with metadata describing its subject, educational level, format, etc. To yield systematic results this needs to be controlled centrally. However, teachers and others should have the facility to tag material themselves and so usefully enrich 'official' metadata. Hwb will offer a simple and intuitive search interface, so that teachers and learners can locate material of relevance to them with the minimum effort.

The contents of the collection over which Hwb has control will be stored securely on behalf of all Welsh learning providers, in what is often termed a 'trusted digital repository' (TDR). This could be managed by Hwb itself, or commissioned from private suppliers or from a public body (in Wales).

It is important to understand that in most respects this will be a virtual rather than a real digital collection. Items will reside in different locations, e.g. in the case of licensed learning resources they will be held on the servers of commercial publishers. The collection will function mainly as a simple pointer to those resources it recommends. The teacher may access the resources themselves in a variety of ways: for example, on YouTube, on iTunes U, on Flickr, or on a public body's website. The dissemination choice will usually be

made by the originator of the resource: Hwb will not itself be expected to provide a new, comprehensive platform for all materials in the collection, only for those it has direct responsibility for (commissioned materials). It makes sense to use tried and tested technologies wherever possible, instead of devising new platforms and channels.

Maintenance and updating

It is essential that Hwb is able to keep the resources in the digital collection under constant review so that they remain relevant to the educational needs of teachers and learners and that they retain their high quality.

The Hwb portal will sit on servers that will also have to be managed, as will software updates, back-ups, security updates and possibly a service level agreement if storage is outsourced. The team will need to take particular care in the case of resources for which it has primary responsibility, including commissioned material.

Twenty-four-hour web access will need to be assured, so that all users can get access to resources or upload their own resources or messages at any time, from any device, from anywhere. This will be particularly essential for learning that takes place in a non-traditional learning environment. The team will also need to plan for the future and keep up to date with new platforms and devices, and make these available for the users when they arrive.

The system will scan through the digital collection regularly in order to highlight the latest, highest rated and most appropriate resources to users, and the team will make sure that the site does not stagnate and that it is updated regularly in content, layout and associated technologies. The system must be flexible, dynamic, interoperable with other existing systems, and standards compliant.

The team will need to provide user support to its users in a number of media, e.g. telephone, e-mail, video tutorials, live video conferencing, troubleshooting guides and FAQ. There should also be a formal helpdesk and technical support team, with technical and pedagogical advice available.

It would also be useful to provide notification of new content through means such as Twitter, Facebook, blogs and apps, to help keep users informed and involved.

Recommendation

- Hwb should develop the collection (and robust systems to support it), ensuring its continuing relevance to teachers and learners.

External conditions for success

We believe our proposals are essential to achieve a digital transformation in learning providers.

They are essential, but they are not sufficient because they presume the presence of a number of external conditions. The most significant of these are the quality of technical infrastructures and the ability of people to use digital resources outside the classroom.

Universal take-up of digital opportunities assumes that:

- all learning providers, and indeed all classrooms, can connect to the internet at sufficient speeds to enable efficient use of digital resources

- interface equipment – whiteboards, PCs, tablets, mobile devices, etc. – are available widely enough within learning providers to give quick and easy access to resources. 'Bring your own device' solutions may be appropriate here

- learners and teachers are not prevented from using resources by general restrictions imposed by local authorities or learning providers on certain types of hardware (e.g. smart phones), software (e.g. 'apps') or web resources (e.g. Facebook, YouTube or Twitter)

- learners and their parents/carers have adequate access at home (and increasingly on mobile devices) to ensure that technology-enhanced learning in the classroom can be replicated and deepened outside the learning provider.

It will be necessary, therefore, for Hwb to work closely with the Welsh Government and bodies that are centrally concerned with these issues.

Recommendation
• Hwb should cooperate with the Welsh Government and other relevant bodies to ensure the best possible access to digital learning resources, inside and outside the classroom.

The functions of Hwb and the responsibilities of teachers and learners

We recommend that a new and powerful public body, provisionally entitled Hwb, is given responsibility by the Welsh Government for organising all-Wales activities.

Its main functions will be:

- constructing and maintaining a personalised 'dashboard' for all Welsh teachers and learners seeking any kind of digital learning resource. It will act either as the primary gateway or integrate into existing online learning platforms. Through this dashboard learners will be able to access all the learning resources

- embedding interactivity into the service so that teachers and learners feel welcome to treat it as their own resource rather than one imposed on them

- validating and authenticating individual resources to be included in the collection, in part through harvesting online responses from teachers and learners

- ensuring easy retrieval of relevant resources through systematic classification and metadata, and incorporating informal tagging by online users

- commissioning new Welsh resources in areas of market failure

- licensing and purchasing commercially available resources

- applying and negotiating standard licences so that teachers are certain of their intellectual property rights

- providing for the storage, and review and updating, of directly commissioned resources, and other material over which Hwb has care

- training users and drawing attention to examples of good practice, using all available methods

- promoting use of the collection, and in general of digitally mediated means of learning and teaching.

Hwb will inherit the existing resources and some of the activities of NGfL Cymru. It will need to decide which of the teaching resources currently provided by NGfL Cymru should be retained, updated or deleted.

Whereas NGfL Cymru's learning materials remit was restricted to commissioning, Hwb's responsibilities will be far wider, as described on page 18, Who will have access, and how? Likewise Hwb's work in supporting teachers (page 7) will exceed what NGfL Cymru currently

does and will broadly parallel the functions performed for further education and adult, community and work-based learning by RSC Wales.

For the user, the most visible aspect of Hwb will be its online portal or 'dashboard', containing the digital collection of learning tools and resources. The teacher or learner will access the dashboard through a unique logon.

For the dashboard content to remain contemporary and age-appropriate, learner information will need to be maintained centrally and updated as the learner progresses through 3–19 years in education and moves to different educational institutions.

All content will be dynamically created and so will change to reflect both day-to-day progression and longer-term changes. Sources of user information created 'behind the scenes' as technology advances can be altered in a manner transparent to the user.

The dashboard will be a blend of standard national and local (learning provider) content and bespoke content as determined by the user.

It is essential that Hwb is resourced to the level needed to perform its functions, but since sharing and interactivity are critical to the success of the system we propose, teachers and learners will also have important responsibilities:

- sharing their own digital resources with others via the collection, and recommending new resources

- responding online to existing resources, for example by rating their quality and utility, and by uploading their own tagging

- joining and contributing from their experience to online communities of practice

- using the collection and its methods as a sympathetic part of a new, interactive and reflexive approach to learning and teaching.

Recommendations

- Hwb should have a wide range of functions relating to support of teachers and learners and to the dashboard and digital collection.

- The dashboard should feature both standard and customisable information.

Appendix 1: Group members

Janet Hayward	Headteacher, Cadoxton Primary School (Chair)
Stuart Ball	Programme Manager, Microsoft Partners in Learning
Sangeet Bhullar	Executive Director, WISE KIDS
Ty Golding	Headteacher, Barry Island Primary School
Andrew Green	Librarian, National Library of Wales
Dylan Jones	Headteacher, Ysgol Gyfun Bro Morgannwg, Barry
Hannah Mathias	ILT Development Manager, St David's Catholic College, Cardiff
Alan Morgans	Director, Tinopolis
Sioned Wyn Roberts	Independent television producer
Bruce Steele	Managing Director, Hyperspace Ltd

Advisory members

Gareth Morgan	ICT Curriculum Improvement Advisor, Newport LA
Damian Donnelly	ICT Strategy Officer, Carmarthenshire LA

Appendix 2: Presenters and respondents

Presenters

ClickView

Joint Information Systems Committee (JISC)

NGfL Cymru

Apple

Microsoft

RM Education

2Simple Software

Respondents

Association of Directors of Education in Wales (ADEW) ICT Group

Alexandra Community Primary School, Wrexham

Argoed High School, Flintshire

Caerphilly Local Authority

Cardiff Local Authority

Cardiff Schools – Advisory Service

Carmarthenshire Local Authority

ColegauCymru/CollegesWales

Cynnal

Deeside College

Denbighshire Local Authority

Eirias High School, Conwy

ESIS

Flintshire Local Authority

Help From Home

Holywell High School, Flintshire

Llandrillo College

Merthyr Tydfil Local Authority

Morriston Comprehensive School, Swansea

NGfL Cymru

Olchfa Comprehensive School, Swansea

Penygarn Primary School, Torfaen

ProMo-Cymru

Royal Commission on the Ancient and Historical Monuments of Wales

Swansea Local Authority

The College Ystrad Mynach

The National Library of Wales

Torfaen Local Authority

Twynyrodyn Community School, Merthyr Tydfil

University of Glamorgan

Willows High School, Cardiff

Wrexham Local Authority

Ysgol Emrys ap Iwan, Conwy

Ysgol Gyfun Bro Morgannwg, Swansea

Ysgol Gyfun Gymraeg Bro Myrddin, Carmarthenshire

Ysgol Gyfun Gymraeg Llangynwyd, Bridgend

Ysgol Gymraeg Treganna, Cardiff

Ysgol Sant Elfod, Conwy

Ysgol Gyfun Gŵyr, Swansea

Ysgol y Moelwyn, Gwynedd

Appendix 3: List of recommendations

Headline recommendations
1. Establish a powerful organisation (working title 'Hwb') to manage, oversee and develop these recommendations. Its remit will be to lead, promote and support the use of digital resources and technologies by learners and teachers, and create and develop a national digital collection for learning and teaching in English and Welsh.
2. Establish a group, including representations from existing practitioners, as well as other bodies both public and private, to govern the implementation of these recommendations.
3. Ensure that a substantial difference is made to educators' digital competencies and skills, and how they apply them to learning and teaching, by prioritising training and sharing good practice.
4. A national digital collection should be created by acquiring English- and Welsh-language resources through commissioning, purchasing, obtaining licenses, and also through actively encouraging contributions from learners and teachers.
5. Give all users their own individual logon ID, potentially for a lifetime of learning. This will take them into their personalised user experience and will be accessed from anywhere.
6. Ensure that learners and teachers have the freedom to access rich learning and teaching resources from anywhere, at any time and from any device.
7. Manage intellectual property rights in learning and teaching resources to ensure maximum access by learners and teachers and create income from external licensing.
8. Commission new resources in English and Welsh and procure national licences for existing materials and tools, to ensure economies of scale when building the national digital collection.
9. Use existing tried and tested web-based products and services to disseminate existing and new content.
10. Ensure that a culture of digital citizenship is encouraged and developed by learners and teachers. In addition to key digital skills, this will help learners develop the competencies and values to use digital technologies responsibly, ethically and safely, with an understanding of the security and legal issues surrounding the 'digital space'.

Supporting teachers

- Define a set of standard digital competencies needed by teachers to participate fully in the hub, and a range of digital technology applications to enhance learning.

- Include the teaching of these digital competencies and applications in initial teacher training, postgraduate and other programmes, and in continuing professional development.

- Encourage teachers to become members of Naace or ALT.

- Establish e-Coordinators in each learning provider, and a network of local Hwb officers to coordinate activities at a consortium level.

- Use a variety of means to encourage teachers to support one another and share good practice, including an annual Welsh Digital Learning and Teaching Conference.

Sharing skills and resources

- Establish a system whereby teachers may expose their own resources to peer review, and if successful see them adopted and published by Hwb in the digital collection.

- Arrange for digital tools and resources created as a product of teachers' education, training, professional development, INSET days and performance management to be uploaded.

- Fund e-Coordinators to be released from learning providers to share their expertise with colleagues and capture material to be uploaded and shared.

- Highlight and share best practice through reference to Estyn, events and networking services, and partnerships.

- Establish a space for learners on the Hwb portal so that they can share their own digital resources, and encourage them to promote best practice through assessment, awards and other means.

A national digital collection

- Review the current commissioning by the Welsh Government of Welsh-language teaching material (and of any other similar commissioning of educational resources by other agencies), and reform the current system, ensuring a radical shift from analogue to digital medium.

- Prepare a set of standard Creative Commons-type licences to be applied to these resources, thereby encouraging their use and reuse for educational purposes.

- Store and retain these resources in a trusted digital repository.

- Introduce a national licensing and purchasing scheme for learning providers whereby free access to commercial resources can be negotiated at preferential rates.

- Redirect funding from local sources and from print-buying towards all-Wales licensing and purchase of digital resources.

- Hwb should identify suitable digital resource providers and recognise their resources as eligible for inclusion, working with them to ensure educational benefit.

- Hwb should encourage these resource providers to make their resources available to learning providers using its standard licences.

- Hwb should encourage teachers and learners to share their own digital resources and tools with others in Wales by uploading them to the collection.

- Hwb should promote the creation of all kinds of digital resources and tools, and the skills needed to produce them.

- Hwb should develop the collection (and robust systems to support it), ensuring its continuing relevance to teachers and learners.
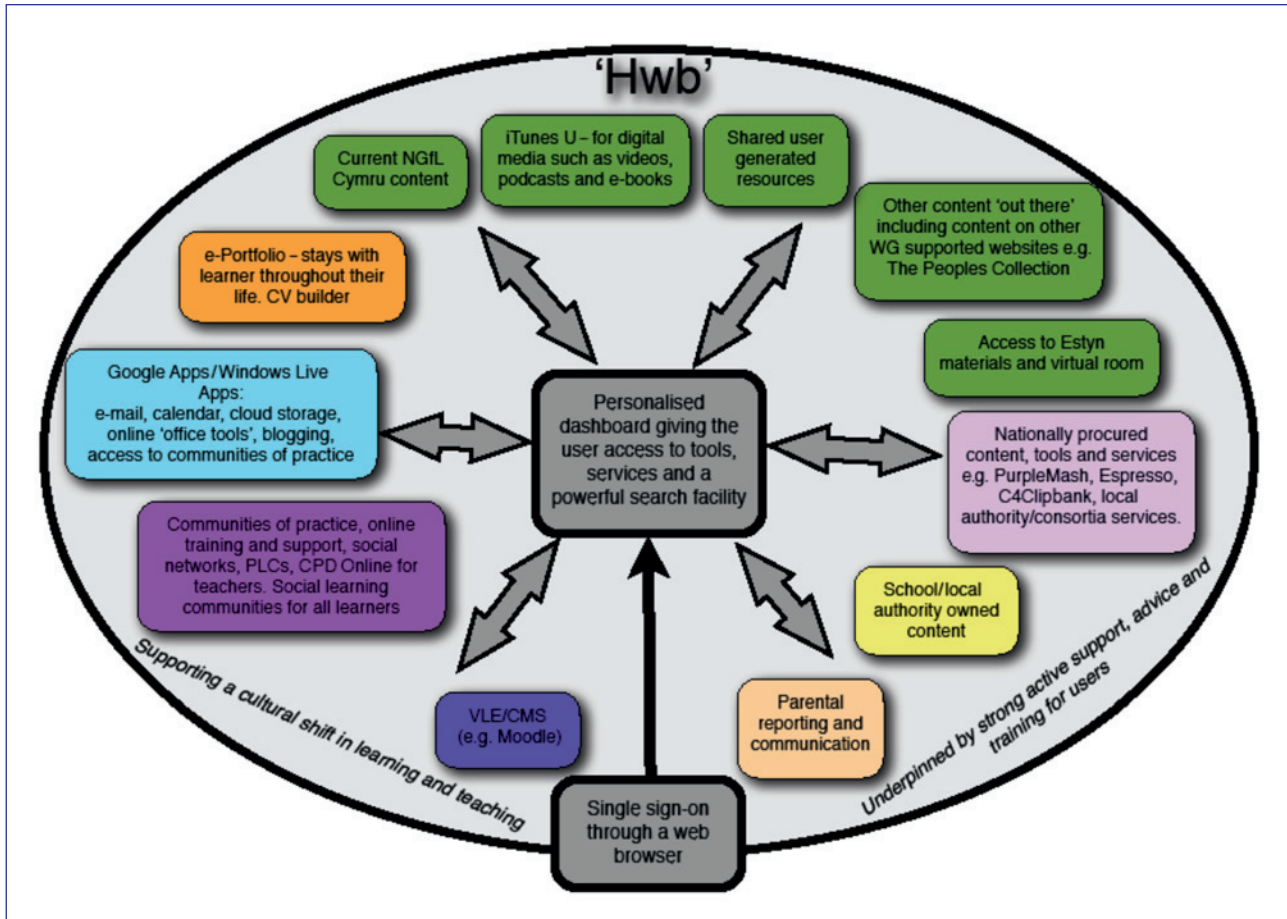
External conditions for success

- Hwb should cooperate with the Welsh Government and other relevant bodies to ensure the best possible access to digital learning resources, inside and outside the classroom.

Hwb

- Hwb should have a wide range of functions relating to support of teachers and learners and to the dashboard and digital collection.

- The dashboard should feature both standard and customisable information.

Appendix 5: Access to the hub through an online learning platform

Above is an example of a dynamic dashboard customised to the learner, in this example a Year 10 school pupil. Content is automatically generated from a range of obligatory sources such as the school online learning platform. Content can also be selected by the learner from predefined age-appropriate sources, e.g. Really Simple Syndication (RSS) feeds. Digital resources to support learning for each subject are accessible via the 'Hwb' national digital collection.

Appendix 6: Glossary and list of abbreviations

ALT
Association for Learning Technology: the UK's leading membership organisation in the learning technology field.
www.alt.ac.uk

ColegauCymru/Colleges Wales
The national organisation representing all further education colleges and institutions in Wales.
www.colegaucymru.ac.uk

Creative Commons
Creative Commons is a not-for-profit organisation that aims to encourage owners of internet resources to share the copyright in them widely and legally through the adoption of standard licences.
www.creativecommons.org

digital competencies
Skills, knowledge and understanding in three related areas: digital technologies, information literacy and digital citizenship. See page 7, Supporting teachers for details.

Digital Citizenship
Include definitions of the norms of behaviour with regard to technology use. There are nine general areas of behaviour that make up digital citizenship: access; commerce; communication; literacy; etiquette; law; rights and responsibilites; health and wellness; security.
www.digitalcitizenship.net

digital resources
The term digital resources is used to refer to (a) a central multimedia library of learning resources and (b) a central bank of tools, software and apps. They will be available free to all teachers and learners in Wales, usually via the internet. See Theme 2: A national digital collection.

digital technologies
The term digital technologies is used to refer to digital hardware (e.g. example, personal computers, tablets, mobile devices) and software and applications that may or may not be internet-based.

Digital Wales
The Welsh Government's strategic framework for the adoption, development and promotion of digital technologies in Wales.
www.wales.gov.uk/topics/businessandeconomy/digitalwales/?lang=en

e-Coordinators

Teachers or other educationalists designated within their institutions to act as the primary hub link with Hwb and other partners. Their main functions will be to arrange training, liaise with Hwb officers, create and maintain links with partners, and act as internal champions and mentors. The role is distinct from that of an ICT Manager.

Eduserv
Eduserv delivers technology solutions demonstrating savings within the public sector, secures preferential terms and conditions on licences for software and online resources for education, research communities in the UK and Ireland, UK charities and other not-for-profit organisations. The agreements are known as Chest Agreements.
www.eduserv.org.uk

ERA licences
The Educational Recording Agency offers licences to educational institutions allowing them to record broadcast output.
www.era.org.uk

Estyn
The office of Her Majesty's Inspectorate for Education and Training in Wales. Independent of, but funded by, the National Assembly for Wales. Its purpose is to inspect quality and standards in education and training in Wales.
www.estyn.gov.uk

hub
Used in this report to refer to the entire proposed system of using digital resources and supporting teachers and learners in applying them so as to improve learning and school performance.

Hwb
The national public body we propose that will be responsible for the organisational aspects of developing and maintaining the hub. See page 24 for a description of its proposed functions.

ICT Self Review Framework
The framework, free to use via an online tool, offers a route for assessing and improving a school's use of ICT.
www.ngfl-cymru.org.uk/vtc/srf-site

information literacy
Information literacy is knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner.

iTunes U
A proprietary Apple product intended as a means of publishing online video and other educational material.
www.apple.com/uk/education/itunes-u

JISC
Joint Information Systems Committee: its mission is 'to provide world-class leadership in the innovative use of information and communications technology to support education, research and institutional effectiveness'. It operates across the UK, mainly in the field of higher education.
www.jisc.ac.uk

learner voice
Learner voice is the involvement of learners and potential learners in shaping the learning opportunities that are available to them. It is a key source of evidence of learners' achievement, attitudes and well-being, and is also likely to be useful in evaluating the quality of teaching and assessment.

learning providers
Schools, colleges and other institutions and settings where those aged 3–19 learn.

Naace
Naace is an association for educators, technologists and policy makers who share a vision for the role of technology in advancing education. Members include teachers, school leaders, advisors and consultants working in all areas of UK education.
www.naace.co.uk

NGfL Cymru
National Grid for Learning in Wales, managed by WJEC (see **WJEC**, page 38) on behalf of the Welsh Government. NGfL Cymru maintains a library of interactive resources for teachers and learners at all levels, consisting of nearly 3,000 downloadable educational resources which support all key stages of the curriculum, from the Foundation Phase to Post-16.
www.ngfl-cymru.org.uk

online learning platform
A collection of integrated tools enabling the management of online learning, providing a delivery mechanism, student tracking, assessment and access to resources. These integrated tools may be one product (e.g. BlackBoard, WebCT) or an integrated set of individual, perhaps open-source, tools.

PLCs
Professional learning communities: a group of practitioners working together using a structured process of enquiry to focus on a specific area of their teaching to improve learner outcomes and so raise school standards.

RSC
JISC Regional Support Centre Wales: its function is to support the development of e-learning and information learning technology in FE, sixth form, adult and community learning, work-based learning and aspects of higher education.
www.jiscrsc.ac.uk/wales

Socitm
The association for ICT and related professionals in the public and third sectors, mainly in local government.
www.socitm.gov.uk

SOLACE
Society of Local Authority Chief Executives and Senior Managers: the representative body for senior strategic managers working in the public sector, mainly local government.
www.solace.org.uk

UNESCO ICT Competency Framework for Teachers (ICT-CFT)
ICT-CFT aims to provide guidelines for planning teacher education programmes and training offerings that will prepare pre-service teachers or facilitate in-service teachers' professional development on effective ICT-pedagogy integration.
www.unesco.org/new/en/unesco/themes/icts/teacher-education/
unesco-ict-competency-framework-for-teachers

Welsh Information Literacy Project
A Welsh Government-funded project that aims to promote the understanding and development of information literacy in education, the workplace, and the wider community in Wales. It has developed a pioneering Information Literacy Framework for Wales.
www.library.wales.org

WJEC
Welsh Joint Education Committee: an awarding body providing examinations throughout England and Wales and providing assessment, professional development, educational resources and support for adults who wish to learn Welsh.
www.wjec.co.uk

WLGA
The Welsh Local Government Association represents the interests of local government and promotes local democracy in Wales.
www.wlga.gov.uk