

Extreme Makeover:
Digital Immigrant Goes Native

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This is the very simple story of a learner once lost now found. It begins with an examination of the social and technological trends that have been observed and are expected to continue to act on the learning space of the individual. It describes the effects on his knowledge (state) and ability to know (process) and how his understanding of his situation is informed by the new science of networks and by connectivism, an emerging learning theory for the digital age. His story begins to resolve as he starts to appreciate the crucial importance of sensing patterns and making connections in order to learn in today's climate. He begins to learn anew with the aid of a diverse range of educational technologies, and in his new *personal learning environment* he is able to explore his interests and directions on his own and at other times connect with friends and others in distributed learning networks. In the way of the popular media, this may be the story of the extreme makeover of a digital immigrant gone native.

Have you often wished for a little more there, perhaps a little less someplace else? Some personal refinements to make you all you could be? Well, me too! My personal makeover is the subject of this case study. So sit back, relax, and let me tell you my story.

This case study starts from April 2004 when I began work in the English Language Program (ELP) at International Christian University in Tokyo, and it is ongoing forever. It focuses on a problem that emerged as I struggled to come to grips with the new demands of work in the ELP, specifically the difficulty of keeping up with, managing, and being able to adequately use the information available to me. This case study may be of particular interest to teachers in the ELP who, like me, are employed on short/medium term contracts and for whom work is defined by constant and ongoing change. In essence, such teachers are *one-person businesses* (Handy, 1994, as cited in James, 2003, p. 422) with

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internal customers to satisfy, job markets to monitor, and the need to constantly promote themselves to their current and prospective employers. The most pressing career issue for these teachers is probably staying current. And this issue is perhaps more in the foreground for teachers in mid or late career who are immigrants in the digital age. In the face of overwhelming growth in information and knowledge driven by changes in technology, staying current is an issue that resonates with many of these teachers at a deeply personal level. It certainly resonated with me, and over the last two years I have undergone a kind of 'extreme makeover' with the goal of rewiring myself in the mold of a learner native to the digital age. This effort has resulted in a new approach to keeping myself current and (hopefully) relevant in the global market for teachers. The 'new' me has been inspired and informed by *connectivism*, an emerging theory of learning for the digital age, by the new science of networks, and by recent work on so-named *personal learning environments*. This case study seeks to clearly connect the new me to emerging theory and to observed changes in today's learning space. It will also propose that personal learning environments are central to learning in the digital age.

Evolution of the Problem

From this point, my need to succeed in the digital learning space and my inability to learn in an effective way will be variously referred to as the situation, the problem, or the issue.

Too much data, too few connections

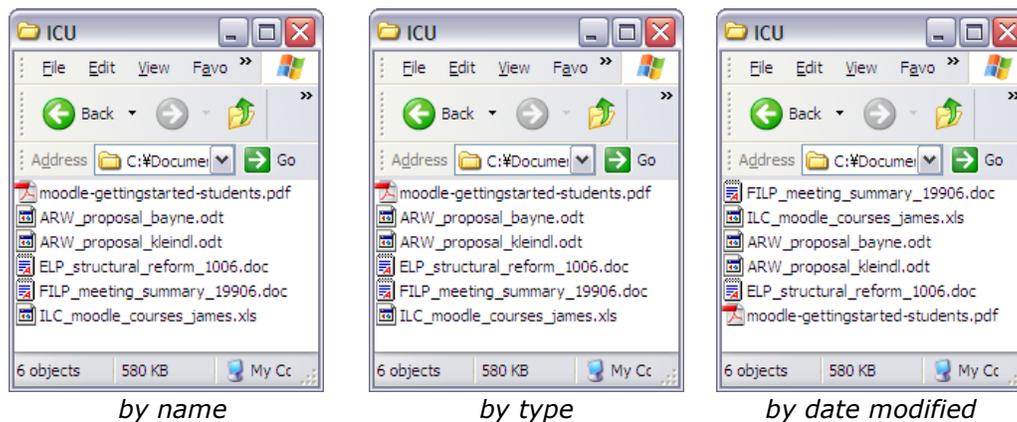
I began work in the ELP in 2004 and education then was about ten years into the era of online learning. Over that time, I had generated a lot of data, but it was still relatively manageable. However, it grew enormously when I incorporated the ELP course materials. It was the addition of this extra data that caused me to notice widening cracks in my personal learning practices.

Learning what I needed to learn was confounded by insufficient connectedness between files at base level and folders at successive levels above. My painstakingly constructed hierarchy of folders was complex, but ultimately messy. Unless I could somehow remember the parent folder, the name, and basic contents of the file, then finding something was a laborious process. It typically involved drilling down the folder hierarchy, through a number of layers, then going into and scanning individual files. While the operating system can be instructed to call folders and files to order by name (i.e. alphabetically), size, type, and date modified, I found doing this rarely made locating a file any

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easier. As shown in Figure 1, connections that exist between files are no more apparent whether the folder is called to order (left to right) by name, type, or date modified. The computer is unable to reveal connectedness in the data and using folders as a simple content management system had become ineffective. By incorporating the ELP materials, I had exceeded a tipping point. I found it impossible to maintain a knowledge structure on top of this overwhelming information. The skills that had previously served me to understand, use, and manage my hierarchical knowledge structure had been rendered out of date.

Figure 1: Little connectedness exists in knowledge arranged in folders



Social and technological change

It is possible to predict where the learning space is headed, because the social and technological forces that will cause further change are already present and have been observed in the changes to the structure and operation of organisations in the last decade. Many points that I will make here are critically informed by the work of George Siemens and Stephen Downes, who have both done much work to promote the emergent learning theory known as connectivism. The central contention of connectivism is that we cannot sustain ourselves as learning/knowning beings in the face of overwhelming knowledge growth and complexification with current approaches; rather, new non-linear models of learning (process) and knowing (state) are required (Siemens, 2007, pt. 3/39). I will especially draw on George Siemens' 2006 presentation *Connectivism: Rethinking Learning*, his book of the same year, *Knowing Knowledge*, and Stephen Downes' 2006 paper, *Learning Networks and Connective Knowledge*. As one of the principle protagonists for *connectivism*, Siemens sees five main forces acting to redefine the learning space including decentralisation, democratisation, the dynamics of what it means to know, distribution, and acceleration. While Siemens is not the first to identify such trends, it is his terms for those trends I will use, and here I will treat only three

that especially resonated with me.

Decentralisation

Decentralisation acts on the structure of organisations. It has produced widespread movement away from complex, hierarchical management structures towards delayed, flatter, more distributed structures. The decentralised organisation is one that is potentially better able to sense, react, and respond to change in its operating environment. My own hierarchical structure of files and folders had failed, collapsing under its own weight. Using folders is also a static solution that does not easily keep up with the flow of information in a dynamic environment. It was clear to me that I required a more responsive knowledge management system.

Distribution

This extremely rapid flow of complex information has made it increasingly difficult for organisations to archive and index knowledge for later retrieval. Organisations have responded by offloading the *act of knowing* onto the network itself (Siemens, 2006b, p. 33). Distribution states that elements of knowledge are stored in individual people across the network, so that connecting distributed individuals wherever they are in the network is what the organisation knows, at that particular point in time. In other words, the structure of the organisation is the structure of the knowledge, and all the knowledge resides in the connections. More and more, organisations are required to leverage the organisational structure itself to access the capacity of the organisation *to know*.

The concept of knowledge as a distributed phenomenon is well illustrated by asking the question, "Who knows how to fly a 747 from Tokyo to Sydney?" To which the answer is, well, *nobody*. No such complicated task can be completed by any single person. No one person can design, manufacture the parts, construct, take off, fly properly, serve the passengers, navigate, and land the plane successfully. The knowledge to do so is distributed across a complex network of hundreds, possibly thousands of people. Moreover, the concept - 'fly a 747' – itself exists because connections exist in a network of people which can actually envisage such a concept only because of those connections (2006, p. 10). This example of distribution demonstrates how knowing has become a phenomenon of the digital network that connects and defines many organizations today.

Organisation-level distribution scales down to the personal level. Instructive is the idea that knowledge is much less a product than a process of flow. Downes posits that the state of knowing requires an individual's learning space to be organised in a particular kind of way, to exhibit patterns of connectivity

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(Siemens, 2006b, p. 50). Viewed in this context, my information management practices were clearly rooted in the idea of knowledge as a kind of end point or product. What I knew was represented by single files, indexed alphabetically (or some other way), categorised into folders and stored in a single, centralised archive on my desktop. It was a model meant to support retrieval of separate pieces, one at a time, at some point in the future. In creating categories, I had created an unconnected knowledge space. The effort required to call up information to answer questions, solve problems, or help others was often frustrating. The thought of carrying the inefficiencies involved in operating in this space further into the digital age was somewhat depressing. According to distribution, what is necessary is an integrated means that would allow me to sense and identify patterns in the daily flow of information, to connect sources, and to connect items in the flow. This would be a significant new personal capacity. Essentially, it would mean making a network of my present learning space in the process of knowledge emerging rather than trying to, somewhat impatiently, fit new information into preexisting categories.

Acceleration

In the digital age knowledge is connected, and knowledge is being remade by this connectivity, quickly! With digital information, connections can be made and new knowledge created readily. In contrast, journals can take months to publish, conferences months to organise, and books years to realise. Furthermore, to bring oneself together with that information requires effort that is not integral to learning itself. Visiting the book shop or the library to get the books, or getting yourself to the conference and then to the actual session is additional effort; sometimes a significant effort. When knowledge is digital, linking to bring ideas together is done with ease.

It is the increased connectedness of knowledge that drives acceleration. And it would not be too much to say that the result has been an explosion of knowledge. One interesting estimate is that a week's worth of reading in the *New York Times* is more information than a person living in the eighteenth century would have come across in *their lifetime*. In addition, knowledge growth is increasing in pace, it is estimated 1.5 exabytes (1.5×10^{18}) of new information will be created worldwide this year - more than in the previous 5000 years. By 2010, the amount of new information is expected to double *every 72 hours* (Fisch, 2007). However, not all knowledge is the same. Rates of change are relative to the field of knowledge in question. There are also various competing claims about how much and how fast knowledge is increasing. Nevertheless, acceleration is clearly an important force reshaping people's learning spaces.

Parallel to the increase in acceleration is a corresponding decrease in the amount of time knowledge remains valid. All knowledge has a shelf-life,

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meaning it is only current or relevant for a period of time. The half-life of knowledge is the amount of time required for about half the current knowledge in a particular field or discipline to become obsolete as a result of continual and ongoing research and innovation in that field. As Siemens points out, what this means is that the value point for knowledge now is much less about how much a person knows than it is about a person's capacity to work with information and manage their knowledge at point of need (2006b, p. 51).

Again, however, not all knowledge is equal. Theoretical knowledge tends to have better longevity than practical knowledge. For example, certain core philosophical concepts have been debated for centuries and remain debated today. On the other hand, core ideas and understandings in such areas as medicine, health, engineering, technology, manufacturing, and finance have a much shorter shelf-life and require people to engage in continual upgrading. So, while it is highly unlikely that the question of our existence will be resolved anytime soon, it is possible that tomorrow could bring a cure for the common cold.

Of course, it has always been the case that there is more information available than any one person could handle. It is just that acceleration has increased the difficulty involved in keeping up to date. A single generation ago, it was not uncommon for the knowledge a person gained in the course of their formal education to sustain them for a lifetime of employment in a particular field; that is hardly the case today. The half-life of knowledge prompts us to recognise that the more knowledge generated in a particular field, the quicker the knowledge in that field becomes obsolete. The half-life of practical knowledge is also variously estimated, one view is that it is presently around two years (Fisch, 2007). In other words, about fifty percent of implementation-based knowledge that students learn in their first year of a four-year degree will be out of date by the time they start their third year of study. This means that ICU and most higher education institutions continue to work on preparing students for a future that has, in effect, already past. The clarion call to ICU, and education in general, is to recognise and respond to the changed state of the learning space, to defocus on knowledge as content and focus on teaching students the skills of how *to know* in their accelerating individual learning environments.

For me, acceleration was a telling factor. It resonated with me in terms of feeling helpless as learner, as well as feeling frustrated with the absence of smart capabilities in my knowledge management system. A smarter system could sense patterns and suggest connections as knowledge emerges during the process of learning. Clearly, my viability as a learner and as a one-person business depended on harnessing new ways to nurture information flow, to make connections in real time and thereby create an adaptive network of my personal knowledge space.

Effects on Today's Learning Space

To this point, I have explained how my problem emerged from the computer operating environment itself and from the pressures of wider social and technological trends that clearly also impact at the personal level. Based on this understanding, it is possible to identify some crucial changes in the conditions of the learning space, which ultimately must inform any possible solution to my problem. Again, I will draw on terms used by George Siemens to express my understanding.

Changed conditions

Continual suspended certainty. One main characteristic of today's learning space is *continual suspended certainty*, which states that knowing is only transitory. Its recognition requires that no declarations of knowing are made with levels of certainty that the traditions of reductionist research might have encouraged. Reductionism was the notion driving much of the scientific research in the twentieth century, and essentially it attempts to grasp the whole by examining it in smaller and smaller parts. In the eyes of some, including Barabasi in *Linked*, reductionism has left us knowing just about everything about the parts, but as far as ever from understanding nature as a whole with "no clue how to continue - except to take it apart further"(6). In this light, *continual suspended certainty* is the more rational position at a time when exponential change is collapsing the half-life of knowledge in many fields. At best, Siemens advises learning is a transitory state and knowledge is a stage of tentative understanding (2006a, pt. 5).

Complexity. Another constant in today's learning space is complexity. Greater complexity is connected to the exploding growth and development of knowledge, to the parallel decrease in the half-life of what is currently 'known,' and to people's ever more connected learning (and working) spaces. Returning momentarily to the example of knowing 'how to fly a 747,' in the case of Orville and Wilbur, it was once possible that a similar notion existed within a network of two (or so). Another example, perhaps a little more familiar to most readers is the increased complexity involved in typing. Other than the mechanics of typing itself, the most common problem involved no more than changing the typewriter ribbon. While the mechanics remain basically the same, if you have a problem today the fix could be anywhere in the millions of lines of code in your software, in your computer's operating system, or in any of the thousands of pieces of hardware that make up your computer. Good luck!

The impact of complexity can also be observed in how individuals approach their learning as well as in the necessity for lifelong learning. There is myriad

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ways to approach learning today. As well as traditional elements like books and courses, individuals have ready access to audio podcasts, interactive Web video conferences (e.g. Elluminate, Breeze), screencasts, texting on a cell phone, 3D learning environments (e.g. Second Life), YouTube videos, blogs, wikis, Google search, social bookmarking (e.g. del.icio.us), audio conferences (e.g. Skype), discussion forums, social networking spaces (e.g. My Space or Mixi), or opportunities that blend such elements in different ways. One thing that these experiences have in common is that they are free, and another is that none existed before the emergence of a technology-enabled structure for learning with computers and the Internet, especially Web 2.0.

Connected specialisation. The third characteristic of today's learning space is directly coupled with greater complexity, but derives at the highest level from the laws of network science. Network science has revealed what reductionism was never going to reveal: that everything is connected to everything else. Although nature is incredibly complex, network science shows us a world that displays patterns of interconnectedness in which everything connects to everything else. Networks have been discovered in all domains studied so far in nature, science, and business (Barabasi 34). Moreover, reports are that all of the network maps reveal a common blueprint, which strongly suggests that common laws govern the structure and topography of all networks (6). One such law returns us to connected specialisation and helps us to understand how it textures today's learning space. Connected specialisation states that when one node in a network significantly improves its knowledge some of that knowledge is redistributed and as a result the entire network benefits. Thus, the continual growth and development of specialised nodes in a learner's network and the distributed flow of knowledge that serves the learner as well as the wider network is what defines connected specialisation.

Chaos. A world of small pieces loosely joined necessitates that individuals accept a level of persistent chaos in their learning spaces. However, learners also require that their knowledge makes sense at the time of need and thus want a certain state of wholeness in their knowledge at that point (Siemens, 2006b, p. 75) at least to the extent that can be attained in any particular context, in any particular situation, and relative to the particular elements that have contributed to the learner's current level of understanding (Siemens, 2006a, pt. 5). This should prompt education to acknowledge *pattern recognition* as the crucial skill that learners need now and for the future. As Siemens notes, it is the ability to identify the patterns underlying chaos that enables learners to turn rivers of information into knowledge (Siemens, 2006b, p. 124).

Consequences

For me, these disruptions had two main consequences. Clearly, the first was

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to find a new model of learning and establish new personal learning practices. I required a different learning model, a new approach that would support and encourage my capacities to sense, react, and respond to changes in an ever more vibrant learning landscape. In essence, I required an approach for learning in the digital age. And the second was to maintain my employability into the future. As a one-person business, the prospect of becoming 'beached' as the world passed me by was a source of significant personal unease. Clearly, connectivism, as a learning theory rooted in the changes that have already occurred, provides a constructive basis on which to fashion a practical, integrated approach for learning in today's climate.

A Possible Solution

Key characteristics of networks & network learning

Based on these key influences acting on today's learning space and their main effects as well as my experiences of the changes that I have already made in my approach to learning (and will presently go on to describe in more detail), I suggest the features in Figure 2 below are key to a strategic solution to the challenges of learning today.

Figure 2: Key characteristics of an integrated approach to learning today

Connected ...exhibits this fundamental property of networks	Smart ...a capacity to sense patterns in information & suggest connections
Open ...is connected in the larger network of networks	Complex ...at the highest level displays the patterns that reflect what a person knows, what the network knows
Flexible ...is responsive to changes in the learning environment	Technological ...handles flows of digital information seamlessly
Distributed ...has the capacity to handle large flows of information	Native ...tools for learning are also learner's work and leisure tools
Intelligent ...person knows network learns, network knows person learns	Centralisation ...collects and displays the related information contained within any node in the network
Self-organised ...information can be defined, filtered, and redistributed within the network	Reliable ...always on (or downtime is within acceptable limits)
Media-rich ...handles all forms of digital media	Publishes ...enables the learner to make public new knowledge artifacts and information that has been modified
Diverse ...contains a range of technologies	Accessible ...available anywhere, anytime the learner is online (offline/online capability is emerging)
Adaptable ...services learner's formal and informal learning needs in work, personal professional development, and leisure	Transparent ...when what a learner knows is public, their learning network also knows
Aggregates ...automatically updates with new information from various sources selected by the user	Social ...encourages and supports formation of ad-hoc networks of learners
Capable ...enables editing and modification of information	Personal ...reflects learner's own needs and interests
Creates ...enables learners to make new knowledge artifacts	
Identity ...user/owner has a 'presence'	

The Personal Learning Environment

The characteristics above describe not only much about networks, but also network learning. What this means is that network learning is social, open, connected, and highly personalized. Network learning appears to be developing with the Personal Learning Environment (PLE) at its core. The concept of the PLE is emerging iteratively, but common to all approaches is its use as a way to keep current in today's learning space. Stephen Downes neatly describes the PLE as "a tool that allows a learner...to engage in a distributed environment consisting of a network of people, services, and resources" (2006, p. 23). The PLE places a diverse range of learning technologies in the hands of the learner with which they can learn to take personal responsibility for their own development free of the constraints of time and place imposed by formal education or episodic enterprise learning. In this context, learning is all about learners immersing themselves in *their* network (p. 22) whether for work, professional development, or leisure.

Without any real idea of the direction I was heading, or knowledge of connectivism, or PLEs, I began to explore and to experiment with the various social technologies that were emerging with just a faint hope that the affordances of social software could lead to improvement in my learning.

At this point, it is heuristically valuable to briefly define what is *social* about social software. Social software enables users to easily create and share knowledge and information, to publish to the Web, and to collaborate with others on projects in diverse networks distributed across the Web. The 'socialness' of social software derives from these applications residing on the Web and from users leveraging the Web as the conduit to connect different applications together in smart, dynamic networks. Some examples of social software were mentioned in the previous section, under complexity. All social applications may interconnect in various ways - by linking, by Rich Site Summary (RSS) for exchanging information, or by Web APIs that enable rich 'conversations' between services. Thus, users of social software are easily able to connect with other learners in mixed-media networks distributed across the Web. A list of the main elements in the current iteration of my own PLE is shown in Figure 3 below. Except for Audacity and PhotoFiltre each element is a social software service with a specific purpose in my PLE.

Figure 3: The main elements in the current iteration of my own PLE

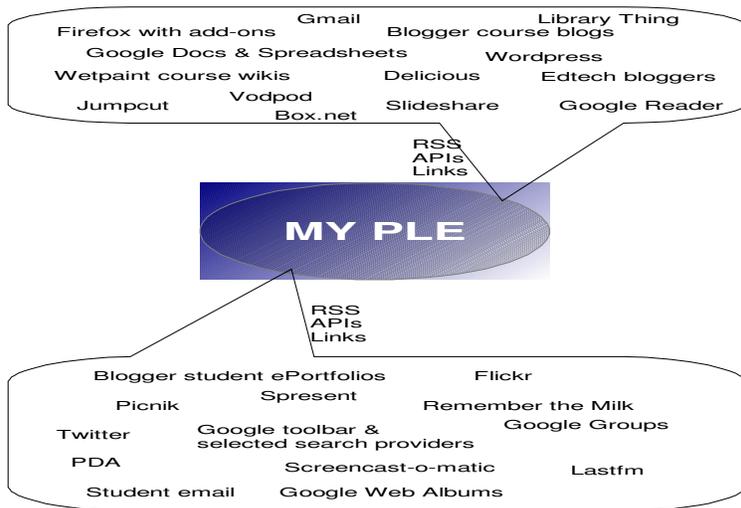
Make documents & spreadsheets	Google Docs & Spreadsheets	Students' e-Portfolios	Blogger
Email	Gmail	Manage a to-do list	Remember the Milk

Figure 3 (cont): The main elements in the current iteration of my own PLE

Read news from the Web	Google Reader, Bloglines	Timetable events	Google Calendar
Professional development	RSS feeds & email newsletters from edtech bloggers	Make audio for podcasts	Audacity (desktop)
Share Web bookmarks	Delicious	Make Web presentations	Spresent
Personal blog	Wordpress installed on Bluehost.com	Provide ubiquitous access to professional development news	Hand held Personal Digital Assistant (PDA)
Host homepages for courses taught	Blogger blogs	Host discussion groups	Google Groups
Create collaborative course content	Wetpaint wikis	Listen to radio...sorry, but I like to sing & work	Lastfm
Share books	Library Thing	Share photos	Picassa (desktop) & Google Web Albums, & for some purposes Flickr via plugin for uploading from Picassa
Collect & share Web videos (& presentations)	Vodpod	Communicate directly with students	Students' university-hosted email accounts
Edit movies for use in multimedia presentations	Viddler, Jumpcut	Edit digital photos	Picnik & sometimes PhotoFiltre (desktop)
Browse the Web	Firefox with various plugins & Greasemonkey scripts	Search the Web	Google Toolbar for Firefox and selected search providers
Back-up and share files	Box.net	Post updates on personal status	Twitter
Share Web presentations	Slideshare	Share screencasts of my desktop	Screencast-o-matic, Jing (desktop)

An important point is that each service in my PLE is native to formal as well as informal learning for work and professional and personal development. As depicted in Figure 4 below, this means that "the context in which learning takes place becomes the context in which learning is applied...and the learning materials become the occupational tools with which the work process is carried out." In other words, in the ecosystem of the PLE work and learning is essentially one and the same thing. Thus, immersing oneself in one's network shapes both the "work process through the application of occupational knowledge, whilst shaping the learning process through carrying out work processes" (Attwell, 2007, p. 3). This is the main strategic promise of Personal

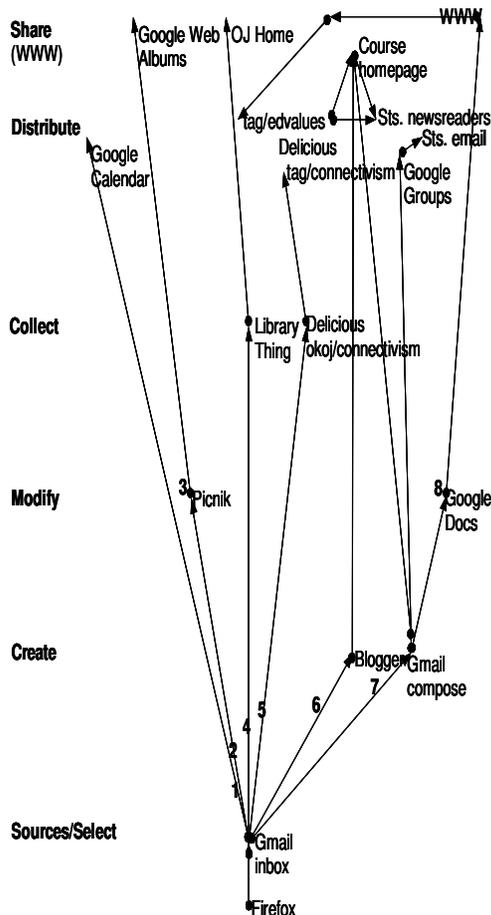
Figure 4: The PLE as an immersive space



Learning Environments, that personal learning is most effective when learning and work are embedded in each other. From immersion in my own PLE over the last twelve months this promise has proved to be mostly true, and I am led to the view that the PLE is essential to learning in the digital age.

Work to learn, learn to work

Figure 5: Active nodes in the work/learn scenario described in Figure 6



To support my claim that the PLE is central to effective learning in today's environment, let me work through a PLE scenario in which work and learning are simultaneous, mutually supportive events. Figure 5, opposite, maps the active nodes/services used to complete eight, integrated tasks in my PLE .

The tasks outlined in Figure 6 below are completed in a single browser window, which constitutes the user interface of my PLE. My PLE leverages the Web to integrate core applications in the service of work and learning as personal and social activities. The left column identifies core work actions, the centre column describes the eight main tasks, and the right column identifies key characteristics of network learning. Please excuse the brevity in the style I use, the heuristic value of the examples may be strengthened if I give only key details and relate them briefly.

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Figure 6: Description of a PLE embedded work/learn scenario

Action	Description	Key network Trait
Select source	Arrive at work desk. Click Firefox (FF) icon to launch. Main nodes of PLE set to open as multiple homepages in separate tabs in single browser window. Browser cookies enable automatic login. Therefore efficient one click access to PLE. Click Gmail tab. Message from work colleague, Ged, catches eye: "Tokyo connectivism conference announced." Ged has included copy of conference homepage in body of email - clever! Displays left to right: list of links to blogs of featured speakers, conference title and image at top, purpose of conference in centre, names of featured speakers and titles of their books bottom centre, and conference dates and location (linked) on right. 1) Gmail has sensed presence of	Identity
Distribute	conference dates & displays <u>Add to Calendar</u> link to right of Ged's message. Click. Dialogue box for my Google Calendar opens automatically, already contains correct title, date, and location. Save. Conference added to my calendar. << Return to Ged's message. 2) Conference image connects to current topic on Educational Values and carries Creative Commons licence permitting reuse.	Smart
Reuse	Needs resizing for my use though. Right click image, select "Edit in Picnik" from context menu. Image automatically opens in Picnik and I quickly resize it. 3) Still in Picnik, save original & modified image to public folder in my Google Web Albums. Add tags (i.e. classifier words) to images: connectivism, arwedvalues. Tags make images publicly searchable and easily available for anyone else to use. << Return to Ged's message. 4) Book title "Creative Uses of Connectivism in Education" by a featured speaker, relates to paper planned for 2008 edition of the <u>ICU Language Research Bulletin</u> . Highlight title. Click "MyLibrary" button in FF toolbar. Library Thing (LT) service automatically opens in new tab and displays details of book from my selected sources including Amazon. I note 44 LT users have title in their collections as well and 4 readers have written reviews. Quickly skim details from Amazon and reader reviews. Click title to add it to my shared book collection in LT. Tag book: connectivism, lrb2008. LT's API will display my recently added books on my homepage. >>Return to Ged's email. Want to do quick check of featured speakers' personal blogs. Click and drag cursor over all and Snap Links FF plugin automatically opens each in a new tab. 5) Spend 10 minutes skimming speakers' blogs, but need to read closer to conference and so bookmark them now for future reference. Right click each tab in turn, select "Save this page in delicious." Delicious dialog box automatically pops up, already contains correct title & URL of the blog on screen. Delicious smartly senses what the page is about and displays recommended tags from classifiers I have used previously, as well as popular tags by other users - "connectivism" appears in both lists. Tag each page: connectivism, lrb2008, conference2008. Click save. All blogs added to my own collection of bookmarks and to collection of whole delicious network. Any user referencing index of delicious tags for connectivism will now also call up these 5 items on the page http://delicious/tag/connectivism . << Return to email. 6) Realise this conference is just as important for students as teachers, must blog about this on homepage for course. Right click link to conference homepage, select "Send to Blogger." Text editor automatically opens in course blog for Educational Values, already contains link to conference. Type a few quick lines recommending students take some time to attend. Tag blog post: connectivism, conference2008. Click publish. Students subscribed to RSS feed for course homepage receive new post promptly in their personal newsreaders. 7) Time to draft today's homework message and will use resized conference image to explain a concept. Click Google Web Albums tab in FF, right click image, select "Send to Gmail." Text editor to compose new message automatically opens, already contains image. Finish writing message.	Social
Distribute Classify Share		Capable Open Self-organised
Distribute Classify Share		Intelligent Social
Distribute Classify Share		Self-organised
Distribute		Smart
Classify Share		Self-organised Intelligent Open
Collect		Social
Create Classify Share Distribute		Creates Publishes Aggregates
Create Classify Share Distribute		Creates

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Figure 6 (cont): Description of a PLE embedded work/learn scenario

Distribute	Call up email addresses for Google Docs & Spreadsheets, course discussion group in Google Groups (GGs), and also course homepage blog. Save as draft, will make adjustments if needed after class. Break for class. << Return to desk. Open homework message, make necessary adjustments. Click send. Message goes to my online word processor, to GGs and from GGs to students' individual email accounts, and to course homepage. One message, three addresses, message distributed to personal word processor service, ~50 email accounts, and course homepage. Students subscribed to RSS feed for course homepage receive new post promptly in their personal newsreaders. 8) Decide to begin new document for in-class activity. Click Google Docs & Spreadsheets (GDSs) tab in FF, click today's class homework message in list of active documents.	Publishes Adaptable Aggregates
Reuse Create Share	Document automatically opens in text editor in GDSs. Delete text, reuse image to support same concept mentioned in homework. Create new student activity. Click publish tab in GDSs editor, then click publish button. This makes the document public at Google hosted location on Web. URL for page appears.	Creates Publishes
Distribute Classify Distribute Share	Right click link to page, select "Bookmark this link in Delicious." Delicious dialog box automatically pops up, already contains correct title & URL. Tag web page: meiland, arwedvalues, student, resource. Students subscribed to RSS feed for items tagged "edvalues" in Delicious receive new content promptly in their personal newsreaders. Link to Ed. Values Web Box also located on course homepage. Course syllabus encourages students to post materials to Web Box by tagging any related Web materials "edvalues" while researching individual writing topics. Anyone may call up items posted by the class research network at http://delicious/tag/edvalues . Time for next class.	Self-organised Aggregates Transparent Open
Share		

Conclusion

The scenario described above is admittedly still a somewhat messy combination of actions and technology. This reflects the current state of the PLE as an emerging notion and as an ecosystem consisting of diverse and relatively immature educational technologies - much trial and error lies ahead before the PLE is ready for mainstream adoption. However, I trust readers have gained a sense of the PLE as a tool which learners can use to explore their own interests and directions, and at other times connect with their friends and larger networks of learners - the benefits of the collective wisdom are just a click away. My final hope is that many readers will feel encouraged to take that first tentative step to dip a toe or more into the river of digital information, because do you know what, the water feels just fine!

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