

The challenge of being (professionally) connected

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Abstract

Throughout the history of humankind, information has been trapped in a physical medium. Cuneiform tablets in Mesopotamia, papyrus of ancient Egypt, modern books, newspapers. Even the most intangible information, the one locked inside the brains of people, usually implied having to coincide in time and space with the device that contained what we wanted to know. That's why, for centuries, we have structured our information management around silos – archives, libraries, collections, gatherings of experts – and around ways to structure this information – catalogues, taxonomies, ontologies. The information lives in and out of the well, there's the void.

With the digitization of information, humankind achieves two milestones: firstly, to separate the content of the container; secondly, that the costs of the entire cycle of information management collapse and virtually anyone can audit, classify, store, create, and disseminate information. The dynamics of information are subverted. Information does not anymore live in a well: it is a river. And a wide and fast-flowing one.

Are we still going to fetch water with a bucket and pulley, or should we be looking for new tools?

Keywords: learning environment, knowledge, e-research, digital literacy, digital skills

During the whole history of Humankind – and most especially since the Industrial Revolution – we have built institutions that have intermediated between our goals and us. These institutions – political parties and parliaments, educational centres and libraries, firms, etc. – have been put at the centre of our lives, and we have quite often built our living infrastructures around them: we get our education at universities that have their library at their core, we vote our elected representatives which are part of political parties whose life has parliaments at the centre, we work and buy and sell in a market that spins around the factory, and so on. These centres have acted like information silos and communication hubs: nothing escaped their eye, nothing spoke but through them.

In recent times – the date can be put as far as the 1950s with the invention of the microchip, to the upcoming of the Web 2.0 during the first years of the XXIst century – the digital revolution has, among other things, implied that the creation and circulation of information has (1) so hugely increased and (2) with marginal costs almost dropping to zero in many cases. Thus, it is just pertinent that the traditional social structure where institutions – and intermediaries – are put in the centre is, to say the least, challenged.

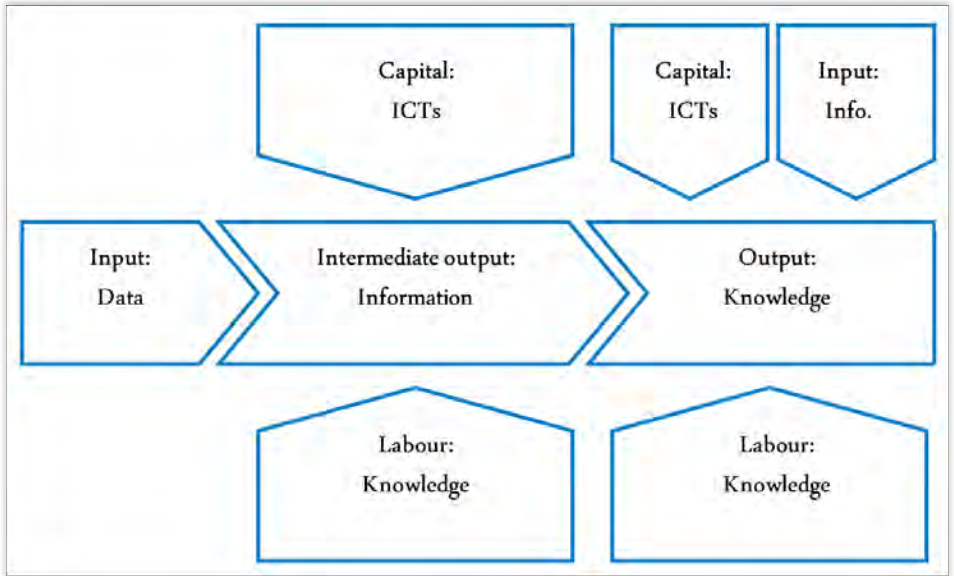


Figure 1: The Knowledge Society stream

The knowledge society creates a stream where data is transformed into information and then into knowledge by applying more data, information and knowledge to the value chain, and with ICTs as its only capital. This stream transforms the usual scheme of communications (sender, receiver, channel, code, message) and makes it more complex, as roles in the scheme are interchangeable all along the process of creating value.

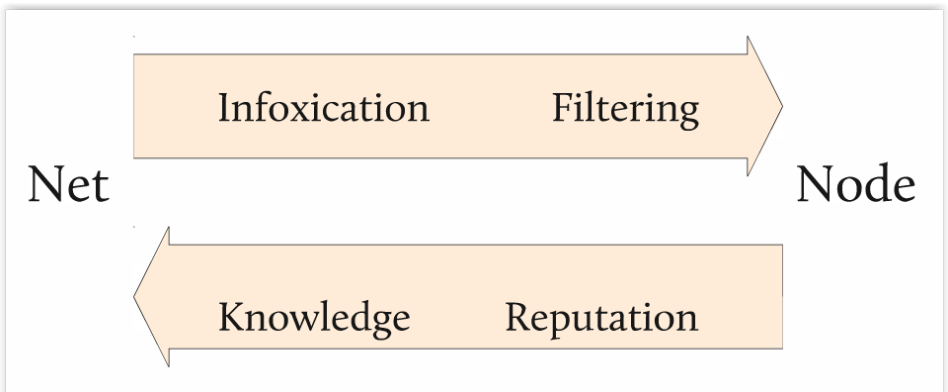


Figure 2: The flow of information in the knowledge networks

This more complex scheme can be represented as is in Figure 2. The abundance of information changes the rules of the game. In a world of scarcity of information, intermediaries were needed to gather, collect and concentrate information to make it available in more efficient and effective ways. In a world of abundance, what is needed is filtering, curation, edition of the existing information. And, indeed, these filtering tasks take place in a decentralized way, by independent nodes connected as a distributed network. Nodes – people, but also institutions – gain reputation according to the way they create and most especially filter and (re)distribute information, oftentimes turning it into knowledge when it is applied. This enriched information, or even knowledge, feeds back into the net, thus closing the circular stream of information in the Knowledge Society (Figure 1).

When we speak about XXIst century professionals being connected, this is the scenario we are thinking about: the shift from an era of scarcity, managed by institutions as intermediaries, to an era of abundance, managed by institutions but increasingly by individuals, connected to the same network, and competing for attention and a sense of meaning.

The Personal Learning Environment

“A Personal Learning Environment (PLE) is defined as a set of conscious strategies to use technological tools to gain access to the knowledge contained in objects and people and, through that, achieve specific learning goals” (Peña-López, I., 2013:2).

Since the coming of the Web 2.0, and especially since the boom of social networking sites after 2007, personal knowledge management has changed a lot. Mainly three things have radically changed the information-sharing landscape:

- More people sharing information on the Net, boosted by the popularization of nanoblogging and social networking sites;
- more ways to share information on the Net, boosted by the “cloud” alternatives to desktop applications;
- a likely improvement in everyone’s (including me) digital skills, cause and consequence (make a virtue of necessity) of the former two.

According to that, a personal learning environment more or less looks now like the figure 3.

If Personal Learning Environment is a blurry concept, it can be thought as a personal research portal or a personal information or knowledge manager. In any case, the basic idea remains: learning, doing research or just managing one’s own information/knowledge becomes central for those performing knowledge intensive tasks.

A scheme of the PLE is here presented in a sequential way: information acquisition (input, what one gets, in red), storage and processing (own self, in grey), diffusion and communication (output, what one creates, in blue). Of course we cannot sequence information management this way: many tools are used for several purposes, processing is also a part of diffusion, etc. But the scheme serves its pedagogical purpose.

The personal website or one’s own set of desktop applications are, of course, the core of the whole thing. What we do, what we are must be centralized. It is the image of what we do and become the

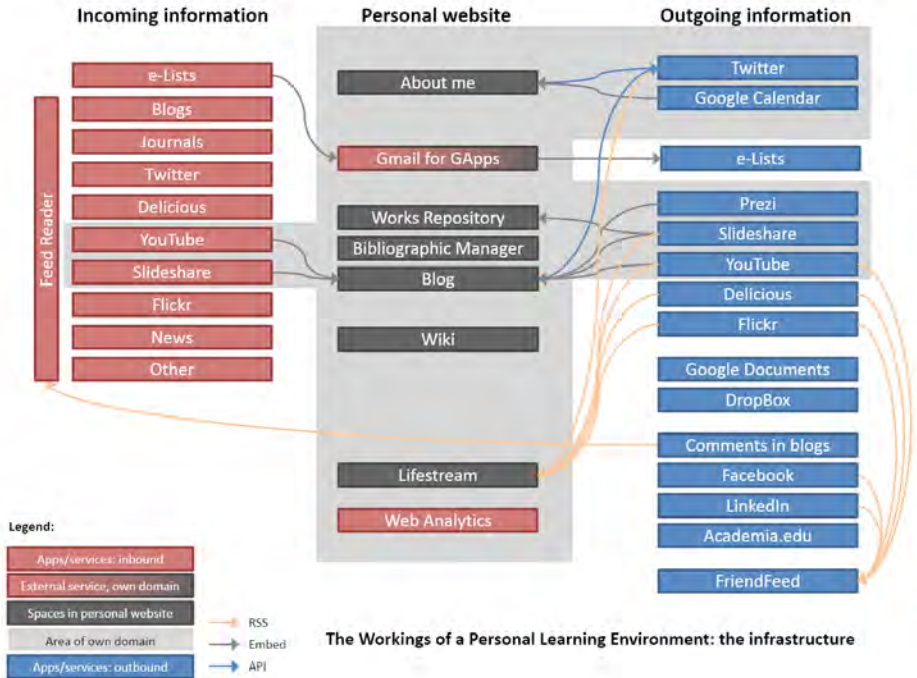


Figure 3: Infrastructure of a Personal Learning Environment

one that has to be decentralized, not the essence¹. Unlike the general trend, that is leading everyone away of personal websites and towards the populating of many social networking sites, we here plead for the construction of the portfolio, for a return to the personal or institutional website, using social media as a game of mirrors that reflects us where we should also be present.

This explains not only why the personal website (the areas shadowed in gray) is not only a huge hub where everything at least passes through, but why most information should be embedded in there, especially all *one's own* production. The blogs, the wiki, the bibliographic manager and the repository all are digital tools that surround one's digital persona (here pictured as "About me").

Linked to this, it worth acknowledging how it is becoming increasingly industrious to keep record of one's own production (whatever its quality). The result of this is that one's digital persona and even one's e-portfolio is scattered all over the Internet. This has consequences on the perception people have on someone, thus consequences in how this someone is evaluated (knowledge, competences,

¹ Of course, contributing to one's digital identity or persona is only possible if one is working "in the cloud" and in the open, and not with desktop applications.

behaviour). **The forces that drive someone to being present in the relevant places are opposite to the forces one has to apply to keep one's things straightened up** and under control. The awareness of one's own PLE helps in keeping one's knowledge ecosystem healthy and clean.

This awareness becomes totally explicit with the help of **web analytics tools**. If used for something more than quantitative measuring, these tools provide precious information if monitored carefully. Among others:

- Discover kindred souls that visited you and you hadn't heard of. Of course, this fact deeply depends of you keeping in topic.
- Discover comments on your opinions and work.
- Discover works that have been listed besides your own, and that you hadn't heard of.
- By construction, discover others' ongoing work and projects and, sometimes, even be able to take part in them.

Mainstreaming the PLE

We have just seen how PLE could be built – or, at least, schematically conceptualized. We here explain how can it work. Or, in other words, how the information flows through it and is fixed and transformed.

An observation, though, should be made about the substance and the form of the PLE which, actually, can be translated into two conditions (necessary, not sufficient) for a PLE to be useful to oneself (not talking here about it being "successful" as measured by third parties). If we understand useful as that it serves our purposes in learning more and better, or doing more research and better, then:

- Setting up a PLE means that one really wants to learn or do research or manage one's own information and knowledge flows and stock, and that one is willing to confront what this means. This basically zeroes in performing the processes of analysis, synthesis, abstraction and critique. That is: read, note, think and write. Many people think that PLEs require a lot of reading or writing. Wrong: it is learning, doing research or managing knowledge that does.
- Setting up a PLE means that one just builds a parallel structure to one's usual pencil and paper procedures. Maintaining two channels requires extra work. The more one mainstreams and focuses in just one platform, the better. And, thus, the PLE is more useful as it increasingly becomes mainstream in the production of one's knowledge and management of one's own network. The limit being when almost *everything* is on one's own PLE.

Personal Learning Environments and the revolution of Vygotsky's Zone of Proximal Development

Developmental psychologist Lev Vygotsky defined what the person or a student can do – or the problems they can solve – as three different stages:

1. What a student can do on their own, working independently or without anyone's help.
2. What the student can do with the help of someone.
3. What it is beyond the student's reach even if helped by someone else.

He called the second stage the *Zone of Proximal Development (ZPD)* which had, as said, two limits: the lower limit, which was set by the maximum level of independent performance, and the upper limit, the maximum level of additional responsibility the student can accept with the assistance of an able instructor. But Vygotsky believed that learning shouldn't follow development, but should rather lead it. A student should constantly be reaching slightly beyond their capabilities rather than working within them (Turner-Attwell, 2009).

This reaching beyond one's capabilities can be pictured as the student entering their Zone of Proximal Development. And this exploration beyond one's capabilities is not to be made alone, but with an instructor to help in the way. Vygotsky called this instructor the *More Knowledgeable Other (MKO)*, the role of which is to help the student throughout their ZPD by *scaffolding* the path they have to follow to learn how to solve new problems.

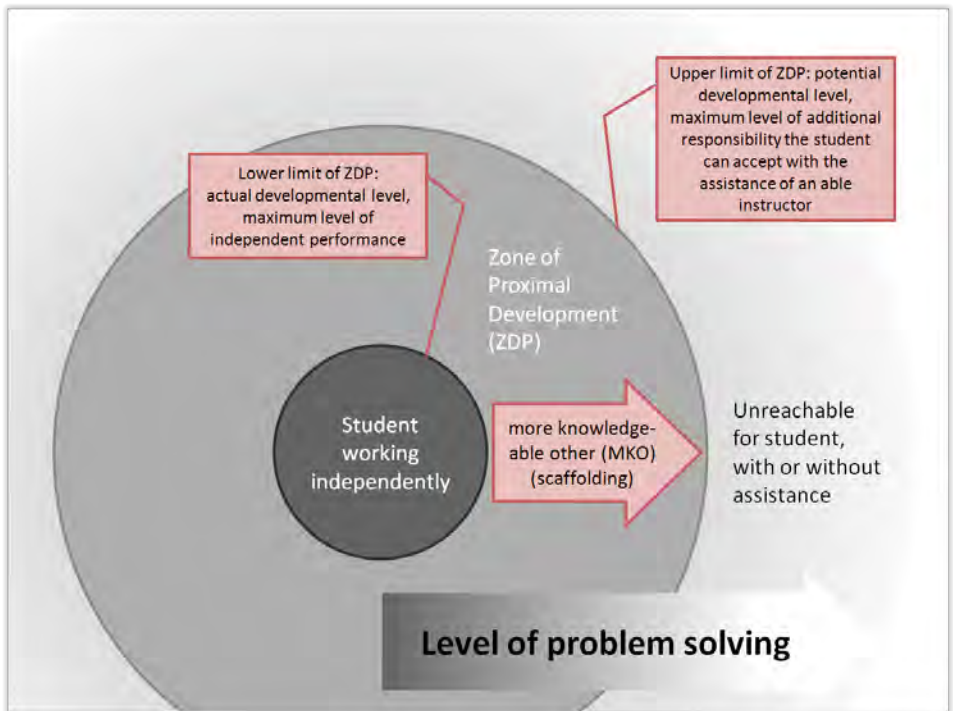


Figure 4: Vygotsky's Zone of Proximal Development (Peña-López, 2013)

A dynamic approach to the Zone of Proximal Development

The Personal Learning Environment can be understood both as the Zone of Proximal Development and the full set of More Knowledgeable Others, understanding by More Knowledgeable Others not only as people of flesh and blood, but any kind of knowledge construct that we can imagine: from the more

typical teachers and open educational resources to all sorts of digital content including messages in fora, multimedia files, professionals in the field and so on. As Graham Attwell (2010) puts it, the MKO can also be viewed as a learning object or social software which embodies and mediates learning at higher levels of knowledge about the topic being learned than the learner presently possesses.

But if we really believe that the Personal Learning Environment is much more than a tool but a knowledge management philosophy, there is much more than we can say in the crossroads of the PLE and the ZPD. The Personal Learning Environment is transferring some – or most – of the responsibility of somebody's learning path from the instructor (back) to the learner. And, in doing so, it also implies regaining the control of one's own learning path and its design. In relationship with the Zone of Proximal Development:

The role of a Personal Learning Environment may be not only that of a tool to provide access to 'More Knowledgeable Others' but as part of a system to allow learners to link learning to performance in practice, through work processes. And taking a wider view of artefacts as including information or knowledge accessed through a PLE, reflection on action or performance may in turn generate new artefacts for others to use within a ZPD (Attwell, 2010).

All these reflections stand for a static approach to the Zone of Proximal Development, that is, at a given time and at a given place. Indeed, in Vygotsky's time, the boundaries of the ZPD were indeed very physical: the evolution of a wood carver's craftsmanship was bound by the availability of master craftsmen and the possibility to be an apprentice in a nearby workshop.

But Information and Communication Technologies have capsized the whole previous scenario and, thus, the relationship between Personal Learning Environments and the Zone of Proximal Development should be approached not only within the state-of-things prior to the Internet, but also in how this state-of-things is shifting forward.

Thus, one way to look at the ZPD-PLE relationship is seeing the PLE as a way to build, fill in with or reach out for the tools and people that will help a learner through the ZPD. Another way to look at the ZPD-PLE relationship is how the PLE (re)defines the ZPD itself, continuously, dynamically.

Unlike in a world without digital access to information and communications, in a digital world content and people are available all at once. Maximalistically speaking, a PLE can be conformed by virtually *everything* that exists out in the cyberspace. If virtually *everything* is at reach, virtually *everything* can be understood as the more knowledgeable other. **With a full, total, comprehensive access to the more knowledgeable other there virtually is no upper limit of the Zone of Proximal Development, there virtually is no level of problem solving that is unreachable for the student.**

The PLE, has then two roles in relationship with the ZPD:

1. It helps in building the inner structure of the ZPD, its components.
2. It helps in building the outer structure of the ZPD, its boundaries.

There is a sort of corollary to the previous second statement. In Vygotsky's time, learning – and hence the ZPD – was sort of linear: woodcarving apprentices would move "up" to a new master craftsman once they had mastered some skills themselves with the help of their previous/actual master. Progress would end when there were no more master craftsmen around whom to learn from. On the other

hand, learning face to face with a human more knowledgeable other meant not only that one had to “use them up” but that one could not “consume” any other more knowledgeable others: learning was unidirectional, linear.

When MKOs are conformed by all kind of tacit and explicit knowledge constructs in one’s PLE, there is no way of (a) “using them up” and (b) not being able to move in parallel with more than one *more knowledgeable other*. We can then think of the PLE both as the biggest ZPD possible, or as the overlapping of different snapshots of a PLE that evolves “fractally”, multidirectionally, on time, on demand, until it (potentially) covers the whole cyberlandscape.

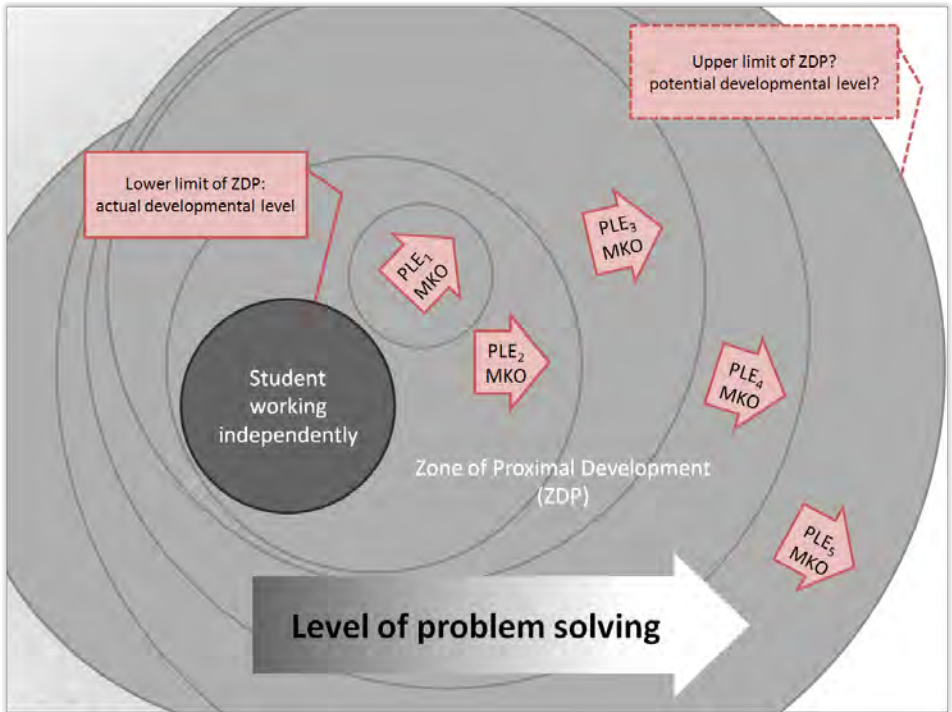


Figure 5: Personal Learning Environments and the revolution of Vygotsky’s Zone of Proximal (Peña-López, 2013)

What is the relationship of PLEs, ZDPs and (connected) professionals and citizens at large? What the actualization of Vygotsky’s postulates shows is that there will be less need for intermediaries – knowledge hubs, knowledge leaders – and much more need for knowledgeable others in order to learn

how to learn something, or how to create new knowledge, or how to apply it. With Personal Learning Environments to cover the ground of one's Zone of Personal Development, learning how to learn, how to design one's own learning process may be more relevant than ever and require more help from third parties. This is, I think, the most promising future of teaching today – and the main reasons for professionals to be connected (among them, not necessarily online – though it will evidently be done digitally).

Project-centered personal learning environments in e-research and open social innovation

Working in a highly intense knowledge field, it is almost unavoidable to think of the personal learning environment (PLE) as a useful tool also for conceptualising or even managing a project, especially a knowledge-intensive one.

As we introduced it, let the definition of a PLE be a set of conscious strategies to use technological tools to gain access to the knowledge contained in objects and people and, through that, achieve specific learning goals. And let us assume that a knowledge-intensive project aims at achieving a higher knowledge threshold. That is, learning.

The common – and traditional – approach to such projects can be, in my opinion, simplified as follows:

- Extraction of information and knowledge from the environment.
- Management and transformation of information and knowledge to add value.
- Dissemination, outreach and knowledge transmission.

These stages usually happen sequentially and on a much independent way one from another. They even usually have different departments behind.

This is perfectly valid in a world where tasks associated to information and communication are costly, and take time and (physical) space. Much of this is not true. Any more. Costs have dropped down, physical space is almost irrelevant and many barriers associated with time have just disappeared. What before was a straight line – extract, manage, disseminate – is now a circle... or a long sequence of iterations around the same circle and variations of it.

It is interesting to reflect whether it makes sense to treat knowledge-intensive projects as yet another node within a network of actors and objects working in the same field. As a node, the project can both be an object – embedding an information or knowledge you can (re)use – or the reification of the actors whose work or knowledge it is embedding – and, thus, actors you can get in touch through the project.

A good representation of a project as a node is to think of it in terms of a personal learning environment, hence a project-centered personal learning environment (maybe *project knowledge environment* would be a better term, but it gets too much apart from the idea of the PLE as most people understand and “sees” it).

A very rough, simple scheme of a project-centered personal learning environment could look like this:

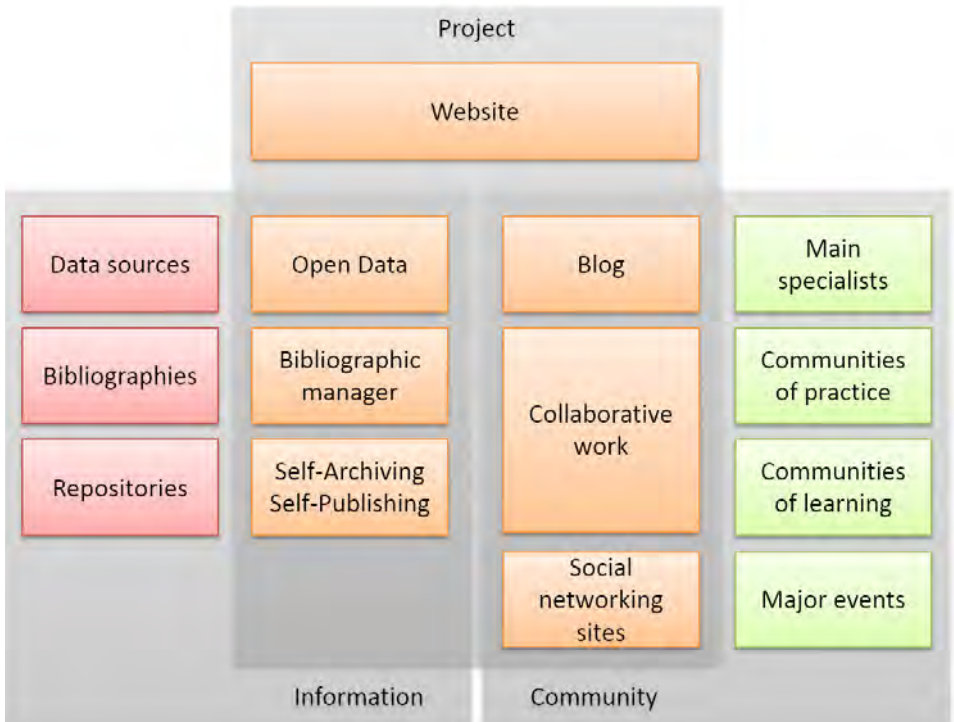


Figure 6: Scheme of a project-centred personal learning environment

In this scheme there are three main areas:

- The institutional side of the project, which includes all the data gathered, the references used, the output (papers, presentations, etc.), a blog with news and updates, collaborative work spaces (e.g. shared documents) and all what happens on social networking sites.
- The inflow of information, that is data sources, collections of references and other works hosted in repositories in general.
- The exchange of communications with the community of interest, be it individual specialists, communities of learning or practice, and major events.

These areas, though, and unlike traditional project management, interact intensively with each other, sharing forth information, providing feedback, sometimes converging. The project itself is redefined by these interactions, as are the adjacent nodes of the network.

There are at least of three types of knowledge-intensive projects where a project-centred personal learning environment approach makes a lot of sense to me:

- Advocacy.
- Research.
- Open social innovation (includes political participation and civic engagement).

In all these types of project knowledge is central, as is the dialogue between the project and the actors and resources in the environment. Thinking of knowledge-intensives projects not in terms of extract-manage-disseminate but in terms of (personal) learning environments, taking into account the pervasive permeability of knowledge that happens in a tight network is, to me, an advancement. And it helps in better designing the project, the intake of information and the return that will most presumably feed back the project itself.

There is a last reflection to be made. It is sometime difficult to draw or even to recognize one's own personal learning environment: we are too used to work in projects to realize our ecosystem, we are so

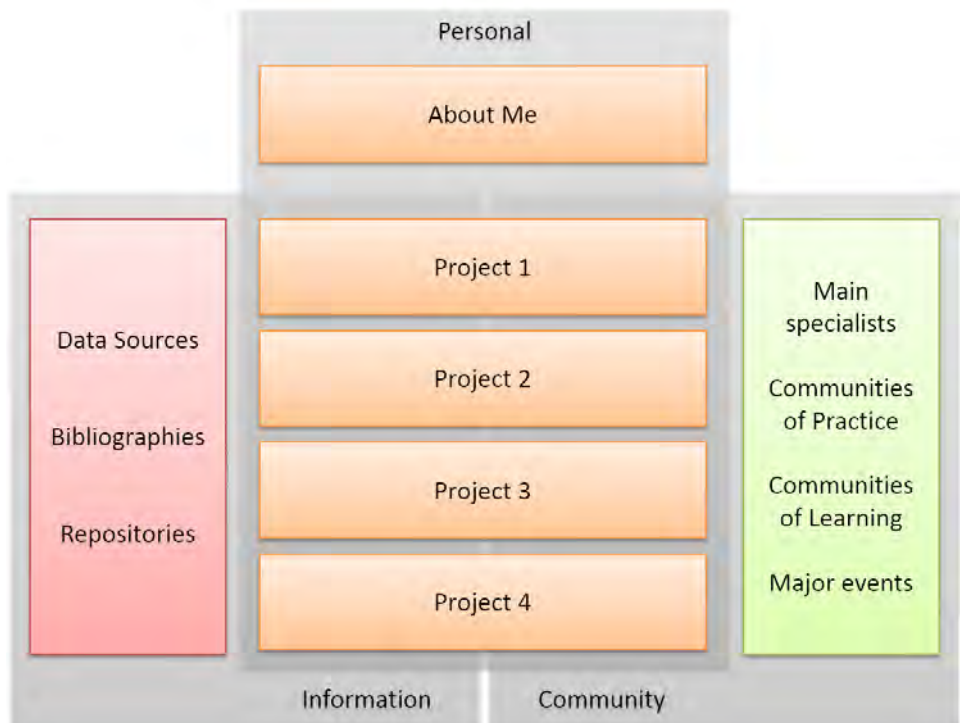


Figure 7: Scheme of a project-centred personal learning environment

much project-based that we forget about the environment. Thinking on projects as personal learning environments helps in that exercise: the aggregation of them all should contribute in realizing:

- What is the set of sources of data, bibliographies and repositories we use as a whole as the input of our projects.
- What is the set of specialists, communities of practice and learning, and major events with which we usually interact, most of the times bringing with us the outputs of our projects.

Summing up, conceiving projects as personal learning environments in advocacy, e-research and open innovation can help both in a more comprehensive design of these projects as in a better acknowledgement of our own personal learning environment. And, with this, to help in defining a better learning strategy, better goal-setting, better identification of people and objects (resources) and to improve the toolbox that we will be using in the whole process. And back to the beginning.

The role of digital literacy

We have so far mostly talked about strategies to learn, do research or manage one’s own information and knowledge. But to do so, besides some tools, there is a set of skills that is especially required and that we can in general label as digital literacy.

In Figure 8 we can see an schematic approach to five different dimensions: technological literacy, informational literacy, media literacy, digital presence and e-awareness (Peña-López, 2010):

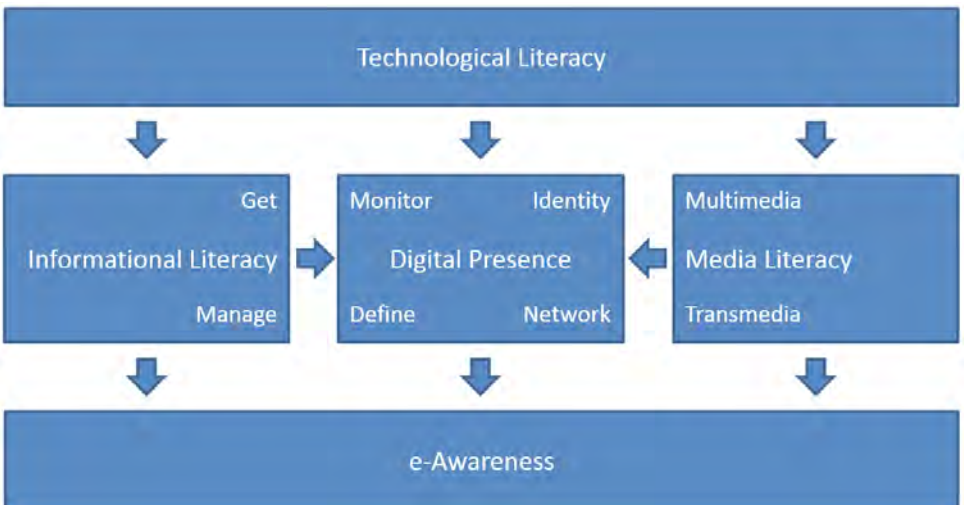


Figure 8: Towards a comprehensive definition of digital skills (Peña-López, 2010)

Instead of defining each and every dimension from the theory, we will do it by using a simple example that, indeed, is an everyday situation that most people find in their daily lives.

On 3 June 2011, Brian Lamb, then strategist and coordinator with UBC's Centre for Teaching, Learning and Technology, tweeted² what follows:



@brlamb
Brian Lamb

Hanging with **@grantpotter** and **@cogdog** at Kootenay Co-Op Radio, ready to simulcast to **#ds016radio** for **#etug** yfrog.com/hss95tdj



Figure 9: **@brlamb**'s tweet: Hanging with **@grantpotter** and **@cogdog** at Kootenay Co-Op Radio, ready to simulcast to **#ds016radio** for **#etug** yfrog.com/hss95tdj

² <https://twitter.com/brlamb/status/76486206115946497>

This tweet might be a little bit arcane for the non-initiated, but it is only a matter of different digital literacies put at work. Decoding it definitely requires much more than what the usual definition of digital literacy implies, but a complex set of skills or competences as the one described above:

- **Technological literacy:** Easy as it may seem at first sight, many people just do not get how twitter works. It is as simple to operate (“just a 140 char. message”) as complex to understand how it works as a whole. Add to this that you have to be following either [@brlamb](#) or any of the hashtags to be able to notice the new tweet. And that you can follow them in several different ways, including different technologies, platforms and devices. Definitely, not *that* easy.
- **Informational literacy:** There are three kinds of links in Brian Lamb’s tweet. At least two of them feature “strange” signs (@ and #) and the other one looks (or maybe does not) like your usual link, but lacking the http:// part (not to speak about the www.). Informational literacy is about telling the difference from those different links, what do they mean and where do they head towards if one clicks onto them. Informational literacy is about being able to find out that [@grantpotter](#) and [@cogdog](#) are two people (that’s more or less obvious once you’ve clicked on the respective links), that [#ds016radio](#) is the [free streaming station](#) used for the [Digital Storytelling MOOC](#) course, and that [#etug](#) refers to the [Educational Technology Users Group Spring 2011 Workshop](#). Easy to find out for the experienced user, those last two do require an effort for the unexperienced one.
- **Media Literacy:** The tweet is accompanied by an image. Its meaning is absolutely related to the information gathered in the tweet (as one would expect) and so it completes the message. Nevertheless, media literacy is not about the image, but about the *crossmedia* and *crossplatform* factors implied by that tweet. The actual message is that for you to get the whole piece of information you have to browse at least 4 websites (Twitter, with information about the profiles and the hashtag timelines; the course, the [radio station](#) and the event website) and then you have to tune in yet another device to listen to the actual radio. Indeed, the word “*simulcast*” already warns you that it will be much more complex than opening a book, sitting and reading. Add to this that you can [add your soundcraft to #ds106radio](#), by using [DROPitTOme](#), a way to operate [Dropbox](#). Oh, and yes, the image was uploaded to a companion service to Twitter, [yfrog](#). Let us acknowledge that this cloud computing thing is a complex one to say the least.
- **Digital presence:** It is very different identifying who the author or who the people mentioned in of the tweet are, from knowing what is their relationship and what is the meaning of them being together doing what is told in the message. But, more important than that, is what will imply for you being related with them. Answering or retweeting Brian Lamb’s message will tell everyone that you are interested in instructional technology. Following Brian would reinforce that message, and being followed back by him and/or other people from his closest professional network can end up implying the fact that you indeed agree with the ideas that this network more or less share: educational resources should be open, learning should strongly be based on building ([constructivism](#)) and remixing and working with your peers ([connectivism](#)), education has a way out of institutions ([edupunk](#)), and so [by the way, my apologies for the simplifications]. There are many messages whose information is about who you are rather than a transmission of rough data.
- **e-awareness:** Taken at a systemic level, Brian Lamb’s tweet talks about very important things. We have just mentioned connectivism or edupunk. But implicit in the message’s 126 characters is the understanding of what is a [massive open online course](#) (MOOC) or how an [amplified event](#) works. Full understanding of the tweet requires awareness on how information and communication technologies are (or

are potentially) changing the landscape of education, how the educational system and educational institutions are being threatened on their very same core and foundations, how the roles of teachers are (or should be) shifting from lecturers to mentors, etc. E-Awareness is about knowing the systemic and strategic implications of living in a knowledge society; and, implicitly, that tweet is talking just about that.

Now, those are 126 characters charged with meaning. If a single simple tweet requires so much digital competence, what is needed for living your daily life at full throttle? What for the exercise of democracy and citizen participation? What for health? What for education? What for love and friendship?

The cycle of technology adoption

How should we proceed to be professionally “connected”? That is, once we became aware of our own personal learning environment, and acquired the required set of digital skills, where should one begin from?

We here suggest four steps to adopt technology, but in a sense where technology is a means to transform our own procedures, the way we carry on our daily knowledge intensive tasks. Let us just keep in mind that Information and Communication Technologies are, by definition, instruments that will contribute to improve our efficiency and efficacy in most – if not all – our tasks related to managing information and communications.

Briefly put:

- Appropriation: one learns how to use a given application, software, piece of hardware, etc. (e.g. one learns to write in a word processor).
- Adaptation: one substitutes one’s old technology for the new one, but one still does exactly the same things (e.g. one gets rid of one’s typewriter and begins to use the word processor instead).
- Improvement: one’s technology allows to perform some new tasks, or the old ones in a more efficient way (e.g. one uses the track changes and commenting features of the word processor to let others collaborate with one’s original document).
- Transformation: the way things worked changes radically because of technology (e.g. one uses a wiki or a pad or an online document to create a collaborative document, share it online and edit it in real time with videoconference support).

We can define four stages in technology adoption:

1. During **appropriation** people get to know what new technologies are out there, they learn how to use them, they master them... but not necessarily use them or use them in a specific environment and for a specific purpose. E.g. learn that word processors exist, learn how to use them, but still use typewriters.
2. In the **adaptation** phase, old technologies are replaced by the new ones, but just to perform exactly the same tasks, routines, processes. E.g. typewriters are thrown away, but word processors are used to type the very same letters. The cost of using a new technology is clearly here an expenditure, as no major benefits appear.

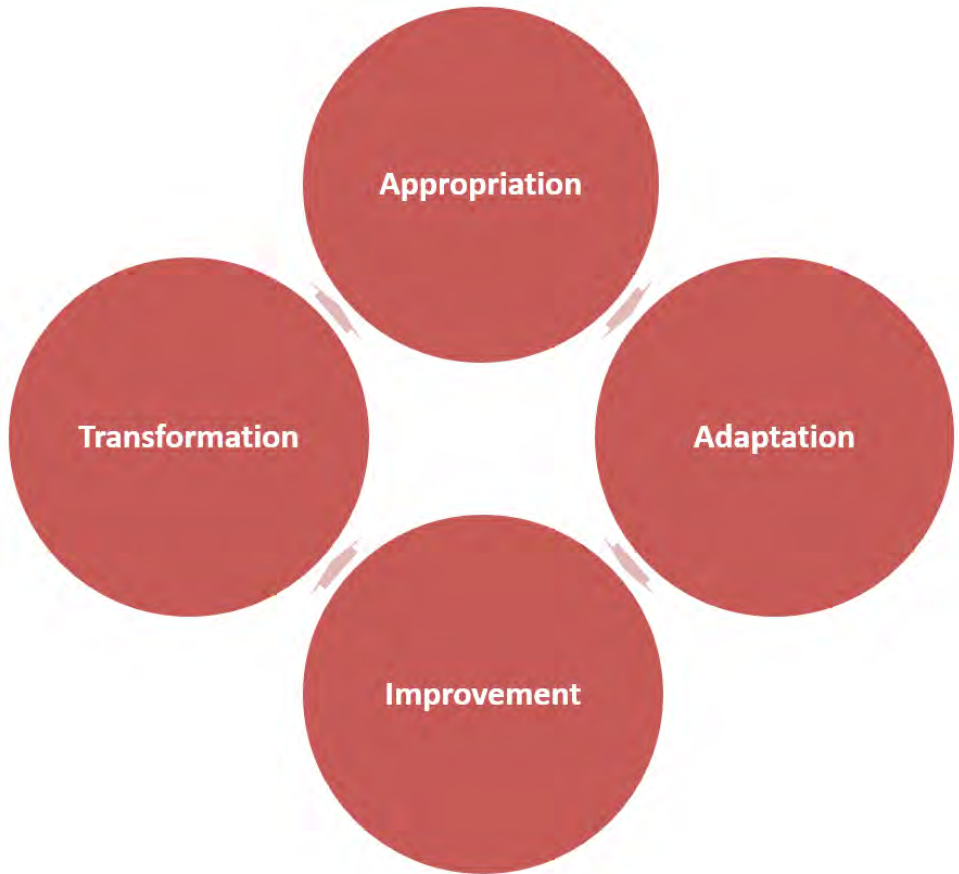


Figure 10: The cycle of technology adoption

3. **Improvement** happens when benefits begin to overrun the cost of using new technologies. Here, costs are investments that pay back in the medium and long term. E.g. word processors are used intensively allowing for thorough edition (copying, pasting, formatting, etc.), tracking changes and versions, passing documents along (by e-mail, that is, another concurring technology) so that they can be commented, reedited, etc.
4. Last, and most important, **transformation** implies that the whole process is thought (almost) from scratch, deploying the full potential of new technologies to redesign processes and tasks. E.g. documents begin not with an original from a single person, but collaborative tools come in place (like wikis, pads or the like) where everyone can contribute at the same time, with no need for centralization, no need for preset structures, etc.

Final remarks on efficiency, efficacy, exclusion and heutagogy

So far we have tried to unfold the general concept of the personal learning environment as a way to be aware of the centrality of knowledge management in knowledge highly intensive tasks; the complex set skills that we usually define as digital literacy; and a simple path to adopt technology for knowledge management and organizational change.

Our first remark, which is implicit in our text, is that the adoption of such concepts, tools and procedures, the initiative to be professionally connected is not an option. That is, of course it is an option, but if we consider it under the light of efficiency and efficacy, it definitely is not. The Digital Revolution has so quickly and deeply impacted our world that (1) information and knowledge are (even more) central to our all aspects of our lives and (2) there is a new and growing set of tools to manage this information and knowledge. Thus, as it happened with the Industrial Revolution, we might well be in a suboptimal position due to the fact that the world – not us – has changed. And suboptimal means that we are using tools that do not allow us to be as efficient and as effective as we could. This scenario, when there is competition, automatically expels us out of the “market”, whatever the market is: the job market, our personal relationships, our access to leisure, etc.

And here comes our second remark: the Digital Revolution is a train with no stops or station platforms were to step aside. On the contrary, the Digital Revolution forces us to (1) be connected with our peers and to (2) be able to re-programme ourselves as the environment changes – which does constantly. Not regarding the requisites of digital times puts us in the hazard of being mere executors of repetitive routines, or being disconnected and thus become irrelevant for our social systems as there is no way that we can put in motion all our potential.

Our final remark is a meta-reflection about the whole process. This is not a linear, but an iterative process. And not only iterative, but self-reflective one. Iterative in the sense that it is expected to be repeated every time there is a change in technology, in organizations, or in its impact in society. Self-reflective in the sense it is not about a one-size-fits-all process, but that it has to be totally tailored for the individual at its centre. And this is the key point: unlike what happened when we had intermediary institutions that made decisions for us, the new reality is one that places the knowledge-holder, that is, the individual, in the centre of a network. Thus, it is crucial that this individual does not only lets himself be placed in the centre of his domain, but that he is aware of it and works for it.

Heutagogy (Blaschke, 2012) stands for a learning approach where all the learning process is self-determined by the learner, the individual. It goes beyond andragogy – or self-directed learning – as it is rooted in capabilities (Sen, 1980; Zheng, 2009) in subjective freedom of choice, in governance over one’s own learning process. And this is what the present will more and more be looking like: being able to put oneself in the middle of one’s microcosmos, identify the planets that orbit around us, and establish flexible and variable connections with them to go on with our own lives. Not being connected, but being able to establish connections: this is our daily challenge now.

Bibliography

- Attwell, G. (2010). "The Future of Learning Environments (short version)". In *Wales Wide Web, June 3rd, 2010*. [online]: Pontydysgu. Retrieved August 01, 2012 from <http://www.pontydysgu.org/2010/06/the-future-of-learning-environments-short-version/>
- Blaschke, L.M. (2012). "Heutagogy and Lifelong Learning: A Review of Heutagogical Practice and Self-Determined Learning". In *International Review of Research in Open and Distance Learning*, 13 (1). Edmonton: Athabasca University. Retrieved February 04, 2012 from <http://www.irrodl.org/index.php/irrodl/article/view/1076>
- Peña-López, I. (2010). "From laptops to competences: bridging the digital divide in higher education". In *Revista de Universidad y Sociedad del Conocimiento (RUSC), Monograph: Framing the Digital Divide in Higher Education*, 7 (1). Barcelona: UOC. Retrieved January 18, 2010 from http://rusc.uoc.edu/ojs/index.php/rusc/article/viewFile/v7n1_pena/v7n1_pena
- Peña-López, I. (2013). "Heavy switchers in translearning: From formal teaching to ubiquitous learning". In *On the Horizon*, 21 (2), 127-137. Lincoln: NCB University Press.
- Sen, A. (1980). "Equality of What?". In *The Tanner Lecture on Human Values, I*, 197-220. Cambridge: Cambridge University Press.
- Turner-Attwell, J. (2010). "Vygotsky and Personal Learning Environments". In *Wales Wide Web, October 1st, 2009*. [online]: Pontydysgu. Retrieved August 01, 2012 from <http://www.pontydysgu.org/2009/10/vygotsky-and-personal-learning-environments>
- Vygotsky, L. (1991). *A formação social da mente*. São Paulo: Livraria Martins Fontes Editora Ltda.
- Vygotsky, L. (2001). *Pensamento e Linguagem*. São Paulo: Ridendo Castigat Mores.
- Zheng, Y. (2009). "Different spaces for e-development: What can we learn from the capability approach?". In *Information Technology for Development*, 15 (2), 66-82. Indianapolis: Wiley Periodicals.



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