

## Adapting Personal Learning Environments to the Workplace?

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*Personal Learning Environments (PLEs) have emerged in the higher educational field with the development of web 2.0 applications and tools. Their main features allow them to be particularly user-centric. They also rely on customization and collaborative learning. As they cater to the learner needs - lifelong and ubiquitous access, PLEs stand at the border of formal and informal education spheres. They nevertheless raise technological and privacy issues that make them somewhat difficult to implement in the workplace. Moreover, business factors and corporate stakes are to be considered when trying to foster community-learning activities within a standardized and controlled environment such as that of the existing Learning Management System (LMS). However, some experiments have been conducted at companies level, leading to promising results for the future.*

**Keywords :** collaboration, interactivity, Personal Learning Environment, company, elearning.

## Introduction

Today, among the great number of innovations taking place in the elearning sector, one of them stands out: the notion of personalized learning.

This notion emerged with educational psychologists such as Piaget and as early as the theory of constructivism. Constructivist learning environments require students to use their prior knowledge and experiences to formulate new, related, and/or adaptive concepts in learning (Termos, 2012). Educators utilizing a constructivist perspective emphasize an active learning environment that incorporates learner centered problem based learning, project-based learning, and inquiry-based learning, ideally involving real-world scenarios, in which students are actively engaged in critical thinking activities.

With the Web 2.0 and collaborative situations such a learning scenario doesn't need to be implemented anymore. What was once a simulated learning environment has become a reality. This collaborative learning differs from instruction in which the instructor is the principal source of knowledge and skill. Learning takes place through conversations about content and grounded interaction about problems and actions.

Today, constructivism (Siemens, 2005) has given way to connectivism. A theory that replaces experience-based knowledge with the possible connection to someone with the experience. The consequences of this notion are numerous and reach far beyond the learning theory as they also impact management and leadership, media, news and information. Someone's network is necessarily very different from his or her neighbour and therefore their respective learning scopes differ.

The personal learning environment is a personalized version of an elearning platform and encounters quite a success in academia but is still rather absent from professional learning schemes.

Hence the question we are addressing in this paper: Is adapting personal learning environments to the workplace possible?

We will first define what a personal learning environment is, then review the positive learning situations they create in an academic context and finally present and evaluate the existing attempts at the workplace.

## 1) PLEs: a mix of preferred learning tools, learning services and learning resources.

### ***A) What are Personal Learning Environments? A definition in progress.***

The term has no easy and immediate definition and can be understood in many different ways, mainly as a concept or as a tool.

It is a result of the evolution of Web 2.0 and its ongoing influence on the educational process.

As a matter of fact, in an environment where information is ubiquitous, there is a greater premium on skills that offer fast and accurate access to information than the actual information assessment. Personal Learning Environments contribute to that trend because they are easy-to-reach online environments where learners naturally turn to when they need information and education. One could also refer to PLEs as a

mix of preferred learning tools, learning services and learning resources in constant evolution.

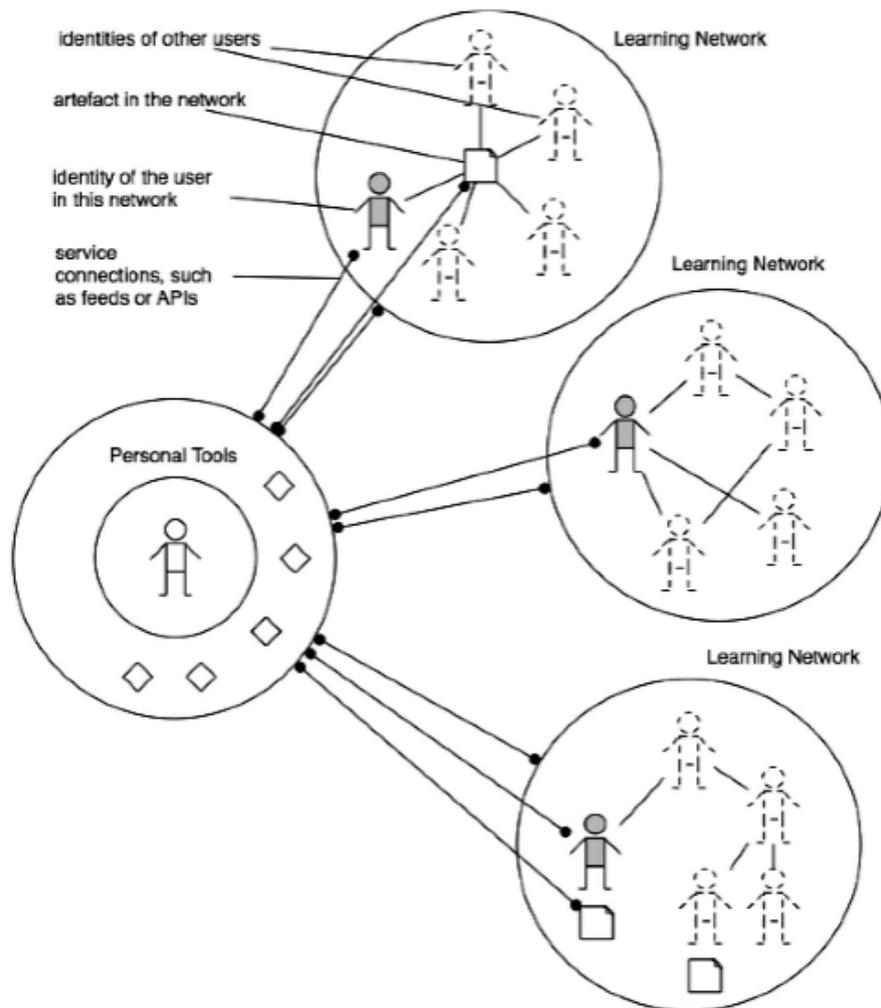
Finally, one thing is for certain: PLEs rely on the learner's ability to engage in a process of self-directed learning which requires a degree of self-awareness.

To summarize, the definition relies on three elements: the concept, the tools and the learner.

### ***B) What it looks like: Is the PLE a tool or a concept?***

A PLE can be defined as a series of tools (Wilson, 2008) used to informally learn as opposed to Virtual Learning Environments (VLE) or Learning Management Systems (LMS). Wilson (2008) argues that: “*personal tools are the technologies with which an individual engages in learning, either on an individual, self-directed fashion or as a participant in a wider network. Personal tools are the extensions of their user; they offer a means with which to engage with the network.*”

The personal tools are as varied and numerous as the evolution of Web 2.0 technology allows it. Those tools allow the learner to interconnect with a variety of networks and therefore to gain access to multiple sources of information from their own personal networks. The following figure shows those interactions.



**Figure 1:** *The personal tools of a user enable them to interact with their identities and the identities of related users and artefacts in multiple networks via a number of service points*

It can also be defined as a concept whatever the tools used (mainly because tools tend to be replaced very quickly because of constant innovation).

Downes (2007) seems to express a similar view when he writes: *“The PLE is a recognition that the ‘one size fits all’ approach characteristic of the LMS (Learning Management System) will not be sufficient to meet the varied needs of students. It is, indeed not a software application per se, but is rather a characterisation of an approach to e-learning.” [...] “The key to understanding the PLE consists not in understanding a particular type of technology so much as in understanding the thinking that underlies the concept” (p. 20).*

Some consider PLEs as neither concept nor tools but as a mix of the two: a powerful tool that enables the learner to take control over their own learning. As Tom Haskins (2007) writes: *[...] PLEs are power tools. They empower the powerless to break out of their boxes. PLEs invite self-directed learning. PLEs become a source of discrepancy and deviation from the “party line”. It becomes possible to think for oneself and disagree with the groupthink. Learning from a PLE makes it possible to see patterns of abuse, exploitation and neglect in the workplace. PLEs undermine the imposed, top-down, command and control kind of power. PLEs put distributed and democratized power in the hands of the individual. It counteracts the conformity pressures without confrontations or insurrections. PLEs are politically radical and perfectly natural.[. . .]*

### ***C) What it is for?***

Personal Learning Environments are a crucial way of gaining lifelong knowledge and skills in an evolving society. The majority of adult learning occurs informally (Livingstone, 2000) and with the help of connected media. Social technologies obviously enabled new learning opportunities and many scholars emphasize the social nature of informal learning in the digital age.

Because web-based technologies have become part of our lives, the PLE serves as a preferred tool for adult learners in the workplace and elsewhere to act on their professional and personal interests.

The PLE can be used for social or business purposes. The PLE can ensure a professional are automatically informed of economic activities such as new contracts or respond to an offer. Therefore, PLEs offers flexibility and satisfaction to the user.

### ***D) Main characteristics: learner-centric, collaborative, customizable***

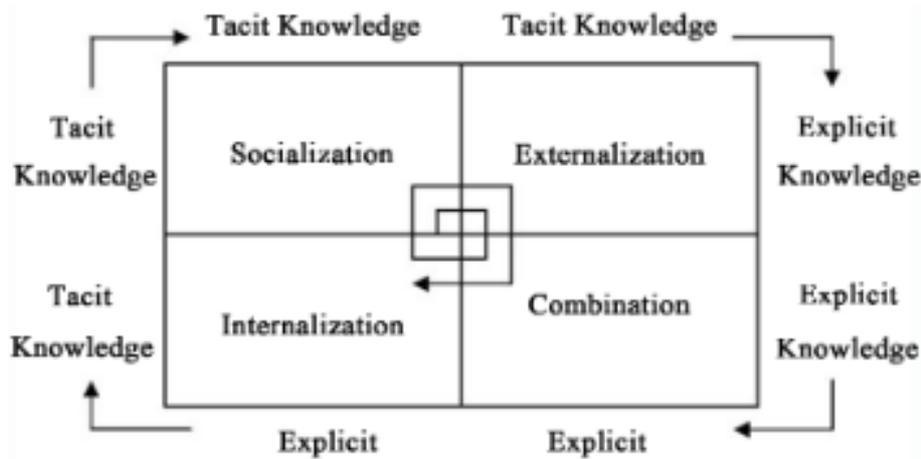
#### ***A learner-centric environment***

It's now commonly accepted that learners who use PLEs rely on their peers to direct their learning whereas workplace learning often relies on a one-direction flow of communication with Learning management Systems and their modules and courses. One could therefore oppose, PLES and LMSs: PLEs are learner-centric whereas Learning Management Systems are course-centric

Innovations in higher education have embraced this trend of personalizing learners' environment. As early as 2009, universities such as Penn State have encouraged an approach where students create their own PLEs to house their personal reflections

and digital content, return to it and repurpose it to other tools. Yet, workplace learning has different stakes. It can be formal or informal depending on the company size, transfer and integration of methodologies and tools, but it is nonetheless a very different environment from academic universities, mainly because economic goals differ.

PLEs must provide lifelong access and must be learner centric. They contribute to self-regulated learning and to knowledge creation. Such a process can be represented by the following diagram (Nonaka, 1995) including tacit and explicit knowledge.



### Socialization

- synchronous and asynchronous communication discussions, brainstorming, expert interview
- engaging with the learning community through Facebook, Twitter, Skype, Google Hangout, webinar and video conferencing, Learning Management System (Edmodo, Ning, Moodle)
- Interacting with discussion through LMS (Edmodo, Ning, Moodle)

### Internalization

- Searching information and academic papers on Google Search and Google Scholar, Wikipedia, Wikibooks, Wikispaces
- Interacting with formal course content through LMS (Edmodo, Ning, Moodle)
- Reading blogs of industry experts

### Externalization

- reflecting on learning through blogging with WordPress or Blogger
- commenting on related blogs
- creating and curating content on YouTube, Pinterest, Slideshare using online tools like Gmail, Google Docs, Drive, Translate, Evernote, Mindoro (mindmap), Adobe and Prezi

### Combination

- Sharing content through Facebook, Youtube and Pinterest
- Social bookmarking of resources through delicious or edutech.net
- RSS for blogs
- Liking Facebook or Retweet on Twitter

## *A collaborative environment*

The network is the very essence of the PLE. Its nodes and links provide constant collaboration between users. It is often open source and there is no hierarchy and produces cross-pollinated collaboration: the very essence of a PLE. For Himanen (2001), in some ways, it is similar to the open learning model of hackers who “starts

*out with setting an interesting problem, working towards a solution by using various sources and then submitting the solution to extensive testing. Learning more about a subject becomes the hacker's passion.” (p73)*

The emerging modes of learning activity in the context of the digital transformation of society seem to focus on collectives as their primary unit : networks, communities and spaces. The last decade has witnessed a steady increase of accessible and affordable options for collective learning not linked with traditional teaching and instruction. Individuals update their PLEs by combining the online and offline sources and offering their own work as downloadable material for others in their network and thus offering a new class of open resources for learning.

### ***A customizable environment***

Collaboration serves the individual goal and autodidaxy remains a self-directed learning mode, which requires a degree of self-awareness.

The need for personal sense-making is at the core of the PLE and is a work in progress along with technological transformation. As Evans (2015) asserts, *“Simply participating in these learning networks is not a means to an end but is part of an end itself.”*

Customizing means “modifying (something) to suit a particular individual or task”, according to the Oxford Dictionary. A customizable and customized learning environment makes it possible for learners to engage in a free, autonomous, passionate and collaborative process.

Therefore, the question we are addressing in this paper is: “Is such a learning process adapted to workplace learning?” (Siemens, 2005) concludes in a paper exposing the theory of connectivism that: *“the pipe is more important than the content of the pipe. [...] As knowledge continues to grow and evolve, access to what is needed is more important than what the learner actually possesses.”*

## **II) Frameworks for the integration and diffusion of PLEs**

To analyze PLEs and their adaptation to the professional field, we decided first to study how, where, in which contexts, and for which purposes they are commonly used. To do so, we reviewed research articles dealing with Personal Learning Environments and the concepts attached to them.

### ***A) The implementation of PLEs within the higher-education field***

During our research, we found out that PLEs are mostly used in the higher-education field, as innovations used on their own or to complete VLEs (Virtual Management System) and more specifically LMSs (Learning Management System).

#### ***VLEs versus PLEs***

Wilson describes VLEs as following “a consistent model of integrating a set of tools (forums, quizzes) and data (students, content) within a context of a course or module... [following] the general education organizational pattern” (Wilson, 2007).

In the education field, LMSs present advantages as they allow to organize learning material and activities as well as the learners' registrations and their progress (Peret 2010). However, they also raise some issues:

- The learner encounters restrictions, as the VLEs are not open to the outside.
- The learners cannot share or collaborate one with another.
- The learners are passive in their learning process and may not be creative nor productive.
- The content of the VLE is predefined, structured, unchangeable, institutionally oriented and often unavailable to the learners after they have left the course.

Besides, nowadays people do not get information only in a formal and academic way. With the Internet, knowledge is made available and accessible everywhere and at any time.

### ***Informal and lifelong learning***

According to Atwell, "*PLEs are based on the idea that learning will take place in different contexts and situations and will not be provided by a single learning provider*" (Attwell, 2007). This principle is called "*lifelong learning*". According to it, learning does not only happen at one time in a particular place, but it is something that never stops. People learn during all their lives in many ways that could be either formal (in the educational system or during training sessions in the professional world...) or informal (by experience, observing others or by looking for the information by themselves...). Thus, the classrooms and the training sessions are no longer the only places and times to learn.

These issues raised by LMSs show how they can be disconnected from the needs and the reality of the learners who are used to using the Internet to get learning by themselves in an informal way.

### ***A student-centered approach***

Following this reflexion, many universities have integrated PLEs to their courses to improve their teaching and pedagogical approaches, as well as for their students to learn better and for longer.

According to the learning pyramid theory brought by Edgard Dale, people learn better when they are active in the process of learning, than when they are passive. Dale showed that people tend to remember only 10% of what they read, versus 70% of what they learn during a collaborative workshop.

PLEs take into account all the remarks previously made and to solve the cited LMS issues, they allow learners to use multiple applications. With the PLEs, the learners are at the center of their learning process, they play an active role in it and "knowledge is no longer transferred, but created or constructed, or developed through active participation in collaborative learning activities, rather than passively received from the teacher" (Kop, 2010). That way PLEs allow the students "to configure and to develop a learning environment [dedicated to] suit and enable their own style of learning" (Attwell, 2007) who can "consume and publish resources

using a service, and users should be able to organize their resources, manage contexts, adopt tools to suit their needs” (Wilson, 2007).

Besides, the spread of mobile devices and the wide scope of Internet access allow people to learn everywhere and at any time. This makes PLEs even more appropriate in the educational field because the student are used to using mobile device for informal learning. In the workfield, PLEs are a suitable model for employees who do not necessarily have enough time to learn during working hours, allowing them to learn at home or when commuting.

### ***B) Finding answers to PLEs issues***

Despite these advantages, PLEs raise some issues too, that can be solved for some of them.

#### ***Assessment***

The first issue raised by PLEs is the assessment and how to evaluate the learners on the knowledge they have acquired, when the formats of their productions can be very diverse. Some authors as Peret, argue that it is impossible to evaluate students with PLEs as they “are not a priori suited for formal learning” (Peret, 2010) while others have found solutions.

In the latter cases, the assessment is then not a test to check that the learners can “recite” what they were taught as it usually is in a normal academic course. It is more a work showing what knowledge or which competences the learner has acquired during the learning process/period. The assessment is generally:

- A portfolio
- An e-portfolio
- A blog

All these items are generally open for other learners or people of the outside to rate, to comment and to share, for example.

#### ***Cohabitation with LMSs***

Another issue is the future of the LMSs. Academic institutions have widely invested in LMSs. Not using them and completely replacing them by PLEs can thus be difficult for some institutions. Some of them have found a solution by integrating an LMS, such as Moodle, to the PLE. That way the two types of learning system cohabit and are used in a complementary way.

Moreover, it could be difficult for learners to find a balance between the verified information given by formal learning and the importance and variety of information available online. In that sense, some authors such as Wilson prevail to put soft boundaries: “one solution is to accept soft boundaries as being an inherent aspect of context, and to design the PLE to provide locally meaningful context boundaries for the user” (Wilson, 2007).

### ***C) A possible application to the workplace***

Seeing how PLEs have worked as efficient tools in the educational field, it is possible to argue that adapting them to the workplace is relevant. Besides, some companies have already shown their interest in implementing them.

Indeed, it is interesting for them to offer a system allowing the employees to learn by themselves and at their pace, in a collaborative way, solidifying the links between themselves.

Nevertheless, PLEs could also raise issues including technological ones regarding their implementation in workplaces. Take the choice of a provider for the PLE technology or the security of data as examples.

It is thus relevant to wonder if PLEs could give satisfying results in the professional field and what the research literature says about it.

## **III) PLEs' adaptability and connection within the workplace**

Spectacular computer and web technologies progresses from the past decades have led to a complete change in the way corporate organizations develop and a revolution for their staff. Elearning is now commonly used as one of the main means to provide supplementary knowledge, skills and convey learning material.

Following this major shift in the educational and training landscape, formal (institution-based) computer-based learning programs and tools such as LMSs have been widely implemented. More flexible and informal (non-institution based) learning models, such as ones relying on PLEs have yet to work their way through the workplace as they did in academic institutions.

### ***A) Factors influencing diffusion and integration***

The integration of PLEs within corporate organizations collides with business factors. Some of them have been identified in an exploratory study conducted within a variety of private organisations in the UK. (Chatterjee, Lai-Chong Law, Mikroyannidis, Owen, Velasco, 2013).

Through a methodological framework provided by the Grounded Theory approach (Glaser & Strauss, 1967), findings were that adopting PLEs at the workplace could be positively or negatively influenced by four high-level categories of business factors.

Organisational factors stood as the most numerous ones. Thus, it appeared that the personal characteristics of the key decision makers, especially their attitude towards change and their outlook in terms of introducing technological change play a great role in PLEs' adoption process. Learning culture within corporate organizations was also identified as a specific concern to the extent that the shift from a dominant prescriptive or didactic culture to a learner-centered one such as PLEs tends to encourage could be difficult to envision. The lack of IT support as well as strategic alignment of the organizational goals to individual outcomes could also hinder adoption rates.

Innovation factors were also mentioned as key arguments. Perceived effort expectancy and how much time consuming PLEs' integration process were stated by study's respondents. To positively affect process, it is crucial to be able to demonstrate PLEs cost-effectiveness over existing solutions and their compatibility with the latter.

As potential adopters could find it difficult to define the concepts and tools PLEs cover, the perceived factuality was viewed as a strong external factor. Eventually, the influence of line managers in the adoption process across the organisation and the way social networks could raise the level of awareness on innovation benefits were mentioned as other key aspects.

Aside from these business factors, a major issue on designing PLEs in the workplace lies in problematizing the learning space (Attwell, 2010), with first a need to define a series of relationships: relationships between teachers and learners, between learners themselves, between learners and a wider community and finally between learners and technology. It also includes the key aspect of learning contexts with the distance that can exist between the physical domain of learning and the domain of workers practice.

Thus, there is a wide set of conditions that can impact the diffusion of PLEs in the workplace and somehow make their integration within corporate organizations quite difficult. While reflecting on influencing factors and issues, it is however interesting to consider some experimentations and project showing that some PLEs' features can be adapted to the workplace, particularly ones that link colleagues, expert people, communities within Small and Medium Enterprises (SMEs) to support knowledge sharing and foster practiced based learning.

## ***B) PLEs, practice-based learning and network scaffolding***

Due to fast developing technologies in a globalized world economy, many corporate organizations in the services or industrial fields experience fast changes. This leads to new requirements to ensure products quality and processes fluidity. As a result, new skill requirements emerge at all levels of personnel, including management, workers, technicians, apprentices and trainees (Attwell, Deitmer, 2012).

Therefore, a continuous adaptation of learning and practices processes is crucial. In this rapid changing and complex environment, PLEs features and tools can provide effective answers to corporate organization new challenges.

Thus, a number of use cases have been developed as part of a European Commission supported project aiming to support PLEs. A people tagging application for finding the right colleague to talk to has for instance been implemented in context for careers guidance advisors (Braun, Kunzmann and Schmidt, 2010). When a personal adviser who is presented with a client query does not feel confident enough to give an appropriate response, the application enables him to seek for colleagues' help based on their expertise and knowledge on a specific matter. The learning experience relies there on co-workers interaction with each other through an online customized tool.

The potential of PLEs to support work-based learning has also been envisioned at the level of Small and Medium Enterprises (SME) within the north German building and construction sector (Attwell, Deitmer, 2012). Educational and training models, as they are traditionally implemented in this sector, do not show satisfying results as

far as meeting challenges of the emerging new skills and quality requirements. Researchers stated that: “*the qualifications required of workers within such production or service environment are broader than in traditional workplaces reflecting a shift from functional skills towards multiskilling*”. Accordingly, they developed a scenario fitting this multiskilling approach.

Based on learning through networked scaffolding, a concept with several learning layers was defined: a layer that invites informal interactions with people across enterprises, one that support creation, maturing and interaction, and a layer that situates and scaffolds learning support in the workplace. These layers provide “*a shared conceptual foundation independent of the personal tools people use for learning*”. Workers then interact with each other and establish “*new and complementary views of existing learning materials*”. Interactions can take the form of QR tags workers stick on devices to provide and receive information on demand. Information is delivered as text, pictures or video. Another form of this networked scaffolding is a system suggesting the courses material previously used or created by a co-worker in order to perform a specific task. People can also post questions on a forum, get notified when new learning material is available, or get access to video conferences with subject matter experts within their enterprise.

Other projects, such as Business performance improvement Through individual employee Skills Training (BOOST, Kravchik, Neulinger, Klamma, 2014) aim at identifying business needs from SMEs and developing adaptive personal learning tools designed to answer them. BOOST largely relies on Web 2.0 e-learning technologies to help people train and acquire skills according to the context their corporate organization and competitors operate in.

## Conclusion

PLEs present several aspects that could be relevant to learning in the workplace taking into account the learner's experience and the life-long span of learning.

After researching, we tend to think that PLEs today are more suitable and adaptable to the educational field than to the workplace. Nevertheless, as a learner-centric and collaborative concept it is also an interesting approach for companies that want to make training and practice-based learning more efficient and flexible.

As companies get progressively aware that making people collaborate, designing innovative learning material using web 2.0, and personalizing learning modules could be a key to successful learning, solutions based on adaptive learning have emerged.

We can observe for example the growing spread of digital academies that provide innovative and collaborative learning areas, where people can relate to each other, ask questions, help and get helped.

Another solution is emerging. Mixing teaching and maths, it may be able to evaluate the interest and the knowledge of the learner at the beginning of a module, to then adapt the content of the learning module, thanks to algorithms.

Could these solutions be considered as PLE adaptations? Do they represent the future of learning at the workplace?

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