Personal Learning Environments: Challenging the networked ecosystems with people agency[1]

Entornos Personales de Aprendizaje: el reto de la agencia de las personas en los ecosistemas conectados[2]

Linda Castañeda
Universidad de Murcia, Spain
lindacq@um.es

Graham Attwell
Pontydysgu, United Kingdom
Graham10@mac.com

Nada Dabbagh
George Mason University, United States of America
ndabbagh@gmu.edu

Abstract. –

Personal Learning Environment (PLE) – as an idea, approach and concept – has demonstrated the potential to support a learner-centred digital learning ecosystem that is diverse, individualised, adaptive, integrated, transparent and skill-based. In a PLE, the locus of control shifts away from the institution to individuals, to the agency of individuals, helping them take control of their learning and build a personal cyber infrastructure and learning ecosystem that extends learning beyond the classroom, institution, or organisation's boundaries using distributed and portable tools and bringing together both formal and informal learning.

Understanding what a PLE is and reshaping educational systems to support PLE is more important than ever; as part of the process of refocusing learning and learning environments to prioritize people's agency in the current technological and social conditions.

This special issue was conceived as an effort to collectively explore the pathways and challenges of adopting the PLE as a legitimate approach for self-education and lifelong learning and engagement in contextual change. The papers included have a variety of perspectives - theoretical reflections, conceptual analysis, literature reviews, learning and teaching experiences – from the learners' point of view and from the instructors' point of view, as well as tools for improving student experiences. They also include a review of projects that confront the challenge of PLE challenges, and propose research paths that explore different aspects of the implementation of the PLE. This issue brings together authors from different countries and provides data that broadens our view of the object of study and can enrich the discourse.

Key words. -

Personal Learning Environments, PLE, Networked Learning, Learners' Agency.

Resumen. –

Los Entornos Personales de Aprendizaje (PLE), como idea, enfoque y concepto, han demostrado su potencial para apoyar un ecosistema de aprendizaje digital centrado en el

---

alumno, diverso, individualizado, adaptable, integrado, transparente y basado en las competencias. En un PLE, el lugar de control se desplaza de la institución a los individuos, a la agencia de los individuos, ayudándoles a tomar el control de su aprendizaje y a construir una ciberinfraestructura personal y un ecosistema de aprendizaje que extienda el aprendizaje más allá de los límites del aula, la institución o la organización utilizando herramientas distribuidas y portátiles.

En las condiciones actuales, comprender qué es un PLE y remodelar los sistemas educativos para reubicar los PLE en el centro de ellos es más importante que nunca. Se trata de revalorizar la importancia del PLE de las personas en las condiciones tecnológicas y sociales actuales. Eso implica reestructurar la enseñanza y el aprendizaje, dando verdadera prioridad a la agencia de las personas.

Este número especial se concibió como un esfuerzo para explorar colectivamente las vías y los retos de la adopción del PLE como enfoque legítimo para la autoeducación y el aprendizaje permanente y para participar en el cambio contextual. Los trabajos finalmente incluidos en él, tienen una variedad de perspectivas, incluyendo - reflexiones teóricas, análisis conceptuales, revisiones de literatura, experiencias de aprendizaje y enseñanza - desde el punto de vista de los aprendices y desde el punto de vista de los instructores, así como herramientas para mejorar las experiencias de los estudiantes, proyectos sistémicos para afrontar los retos del PLE, y primeras aproximaciones a vías de investigación que exploran otros aspectos de la implementación del PLE. Además, este número reúne una serie de autores, nacionalidades y fuentes de datos que amplían nuestra visión del objeto de estudio y pueden enriquecer el discurso.

Palabras clave. –

Entornos personales de aprendizaje, PLE, Aprendizaje conectado, Agencia de los estudiantes,

Almost two decades have passed since the first discussions by educational technologists in 2004 about Personal Learning Environments in education, considering the evolution of VLE (Virtual Learning Environments) following the adoption and popularisation of the use of social software. In 2007, Attwell (2007) explained that the term Personal Learning Environment (and its acronym PLE) refers not to a specific service or application but instead to an idea or concept of how people approach learning.

The last decade, especially the period of the COVID-19 global emergency, led to an understanding that a successful learner of any age will integrate knowledge from different sources and people. Moreover, the abundance of available digital resources has enabled self-education and lifelong learning and is seen as increasingly necessary in a fast-evolving and globalised labour market (Sagitova, 2014). This need to manage and integrate different sources of learning at various junctures in a lifespan is reflected in the 2018 definition of critical competencies for lifelong learners by the European Union (European Union, 2018).

PLE can be characterised as a techno-social reality that embodies the socio-material entanglement with which people learn and an approach that enacts contemporary ideas about how people learn (Dabbagh & Castañeda, 2020). The learning ecology of the PLE and its disruptive educational character, position it as a framework that addresses the challenges of continuous learning and empowers learners to develop agency in lifelong learning. We envision the PLE as the core of a learning activity ecosystem that is diverse,

personalised, social, adaptive, integrated, and transparent, enabling the creation of a network of learning that supports students as peers, creators and entrepreneurs, and agents of their own learning.

The disruptive educational character of the PLE in connecting formal, non-formal and informal learning experiences has been one of its most promising attributes (Castañeda, Tur, et al., 2022;). By integrating those experiences, PLEs potentially render lifelong learning or continuous learning an achievable goal. More specifically, the PLE enable everyday citizens to leverage technology to build and pursue meaningful, adaptive, and flexible education pathways to accommodate their learning, work, and life goals and become successful agents and curators of their learning over their lifetime.

The PLE approach, in contrast to traditional personalised approaches, emphasises the importance of the learners' role, as well as the connections of people, objects, resources and motivations for learning and the possibilities of networked learning (Networked Learning Editorial Collective (NLEC), 2020) or connected learning (Bender & Peppler, 2019).

PLEs also illustrate the increasing importance of what is now being called digital competence. Indeed, a lack of digital competence among learners (and among teachers) is a considerable barrier to developing a PLE (Castañeda, Attwell, et al., 2022). But digital competence is fluid, including different definitions of digital competence, and is fast changing as digitalisation accelerates, including critical approaches that enact learners' agency (Jääskelä et al., 2017).

Additionally, the increasing use of big data in education and the rapidly advancing adoption of AI-based applications have led to an increasing concern over ethics. At present, this tends to be linked to particular issues – for instance, bias in AI-based selection, the non-inclusiveness of online proctoring services and concern over surveillance by applications monitoring student attention and motivation. There have been various calls for ethical frameworks and codes of practice. What may be more critical is the idea of ethical practice (mirroring the recent attention to open educational practice). The ethical practice could extend beyond support, care, equity, and support for metacognition, including working with learners to develop their PLE.

PLE – as an idea, approach and concept – has demonstrated the potential to support a learner-centred digital learning ecosystem that is diverse, individualised, adaptive, integrated, transparent and skill-based. In a PLE, the locus of control shifts away from the institution to individuals, helping them take control of their learning and build a personal cyberinfrastructure and learning ecosystem that extends learning beyond the classroom, institution, or organisation's boundaries using distributed and portable tools. Recent debates have suggested that with the availability of a plethora of digital resources, understanding what a PLE is, and reshaping educational systems to relocate PLE to the centre is more urgent than ever. However, there are challenges and barriers that we must identify, reflect on, and explore. Moreover, discussions have to evolve in changing educational and societal contexts (Castañeda, et al., 2022).

Therefore, this special issue was conceived as an effort to collectively explore the pathways and challenges of adopting the PLE as a legitimate approach for self-education and lifelong learning and engaging in contextual change. The answer to the call has been noticeable. We have received many interesting proposals that have given us the opportunity to organise quite an extended Special Issue.

This journal issue is special from many angles. The papers include reflection on fundamental issues and aspects related to the continuing development of the PLE:

- The focus on metacognition and learning to learn, as key to PLE development and knowledge development.
- An increasing interest in socio-technical systems and the interaction between institutions, technology providers and social systems/environments.
- The flourishing of the PLE as a tool for lifelong learning, including learning outside the institutional environment, and consequently, questions about the use of PLE for knowledge development.
- An expansion in the interest of motivation and emotions in learning and in the PLE.
- And, linked to all the above, a growing awareness about the relevance of the variety of research methods and teaching tools that can be used to measure and support PLE development in the areas above.

In addition, the papers include a variety of perspectives, to include - theoretical reflections, conceptual analysis, literature reviews, learning and teaching experiences – from the learners' point of view and from the instructors' point of view, as well as tools for improving student experiences, systemic projects to confront PLE challenges, and first approaches to research paths that explore other aspects of the implementation of the PLE.

It is worth noting that this is an issue that brings together a number of authors, nationalities and data sources that broadens our view of the object of study and that can contribute to enriching the discourse.

The first paper included in this Special Issue is "**Personal Learning Environments: Looking back and looking forward**", a conceptual paper in which Graham Attwell makes an interesting analysis of the state of the art and theoretical update regarding the PLE. The author analyses the reasons that make the concept "fail" on its adaptation to a wider spectrum of institutions and learners. Additionally, Attwell explores concerns regarding the current moment for the PLE idea and social and educational challenges to be confronted in coming years.

Linda Castañeda, Victoria I. Marín, Patrícia Scherer Bassani, Araceli Camacho, Ximena Forero and Lucila Pérez, researchers from five different countries, take up one of the recent challenges of the PLE and explore, with an international sample of university professors, the teaching practices that these professors implement in their subjects to foster the PLE of their students. Therefore, the analysis included in the paper "**Academic tasks for fostering the PLE in Higher Education: International Insights on Learning Design and Agency**" explores those practices from the pedagogical viewpoint using the Activity-Centered Analysis and Design (ACAD) framework, and from the perspective of the development of students' agency.

"**Metacognitive skills and emotions in the construction of Personal Learning Environments**" is a paper that is based on an analysis of students' self-motivation for metacognitive skills in the initial phase of the Self-Regulated Learning (SRL) process during PLE development and to explore the relationship between students' metacognitive skills and emotions. In this study Urith Ramírez-Mera and Gemma Tur offer the possibility of questioning aspects related to learning and to the experience of learning that we think should help us to reconnect the discourse of PLEs – that can sometimes appear to be overly individualised– to a more interpersonal approach that views the character of learning and education as something that reconnects us as people.

Raquel Gil-Fernández, Diego Calderón-Garrido and Carolina Martín-Piñol have written a paper titled "**Exploring the effect of social media in Personal Learning Environments in the university settings: Analysing experiences and detecting future challenges**". In this paper, they offer an interesting review of how the academic literature of the last 10 years explores the relationship between social media and PLEs. Using a mixed methods approach, the authors describe case studies in the literature that analyse or describe the inclusion of social networking sites for enriching the PLE. In conclusion they discuss the role of social networks in the design and use of the PLE, and the relevance of formal guidance in the inclusion of resources and tools for enriching PLEs.

Mike Cosgrave in his article "**Converging Lenses: PLE diagrams, PKM Workflows and Scholarly Ontologies**" analyses three different perspectives on knowledge work – PLE (Personal Learning Environments), PKM (Personal Knowledge Management) and Scholarly Ontologies. The author discusses the usefulness of these three perspectives in enriching the learners' approaches to developing a PLE and knowledge. The different approaches are seen as complementary.

The article "**Reconfiguring Personal Learning Environments in Higher Education**" (included as "**Reconfiguración de Entornos Personales de Aprendizaje en Educación Superior**" because it is written in Spanish), by Cristhian Elizabeth Fuentes-Rodríguez, presents a qualitative analysis of the process of the progressive reconfiguration of the PLE of participants in a law course at a Mexican university. The document offers a close analysis of the changes experimented by participants on their learning practices during the experience, the influence of each of the actors in the process, and the decisions that are being taken. In addition, the article offers a vision from four dimensions of the PLE (temporal, personal, spatial and social), which are explored in depth.

Xiaoshu Xu, Yunfeng Zhang, Kexin Zhong, Vivian Ngan-Lin Lei and Jia Liu, present the paper titled "**Development and Validation of a PLEs Scale from the Learner and Learning Perspective in Tertiary Education**" where they describe the process of creation and validation of a PLE Scale (named PLEsS-LL) to evaluate effective learning in Chinese tertiary education. The paper offers a well-developed methodology and detailed results, as an invitation for the discussion, as well as for exploring the possibility of transferring the scale to other contexts.

In their article "**Assessing the presence of the 'Personal Learning Environment' concept across the web domains of Spanish Higher Education institutions: A web**

mention study", Jonatan Castaño-Muñoz and Daniel Villar-Onrubia present the beginning of what we expect could be long-term research, evaluating the impact of PLE in policies in educational institutions. This first, exploratory study, examines the presence of the concept of PLE across the web domains of universities and other Higher Educational institutions in Spain. This exploration can be considered as the first approach to study institutional policies and intentions regarding PLEs: a novel and challenging approach to understanding the implementation of the PLE in higher education institutions at the level of discourse and policy.

In the last article in the collection: "**Personal Learning Environments as socio-technical systems: Does decentralised data finally give us the right balance?**", Kamashi Rajagopal offers a conceptual article where she theoretically justifies the importance of analysing the PLE from the four main dimensions she identifies (technological, social, pedagogical and organisational) using social-technical system theory. In addition, the author analyses the relevance of data ownership, privacy, and problematic issues around data, and how the conditions offered in projects like Solid (presented in the paper) appear as an answer to concerns in this area and how they could extend ownership of learning and user agency.

As is evident from this review, many concepts are addressed, and many questions are reformulated in this collection. We firmly believe that this is one of the best contributions that a special issue offers to the scientific community, broadening horizons by seeking new perspectives from which to approach the concepts or ideas it deals with. In the specific case of the PLE, we believe that there is still much work to be done, and many challenges to overcome, and we hope that reading these papers will encourage us all to continue working towards advancing the PLE as the VLE of the future.

Acknowledgements

Castañeda, L.; Attwell, G. & Dabbagh, N. (2022). Personal Learning Environments: Challenging the networked ecosystems with people agency. *RED. Revista de educación a distancia, 21*(66). http://dx.doi.org/10.6018/red.454751

References

Attwell, G. (2007). Personal Learning Environments—The future of eLearning? *ELearning Papers*, 2, 8.

Bender, S., & Peppler, K. (2019). Connected learning ecologies as an emerging opportunity through Cosplay. *Comunicar. Media Education Research Journal*, *27*(1). https://doi.org/10.3916/C58-2019-03

Castañeda, L., Attwell, G., & Dabbagh, N. (2022). Entornos personales de aprendizaje como marco de la educación flexible: Explorando consensos, enunciando preguntas y marcando desafíos. *Edutec. Revista Electrónica de Tecnología Educativa*, *79*, Art. 79. https://doi.org/10.21556/edutec.2022.79.2347

Castañeda, L., Tur, G., Torres-Kompen, R., & Attwell, G. (2022). The Influence of the Personal Learning Environment Concept in the Educational Research Field: A 2010-2020 Systematized Review. *International Journal of Virtual and Personal Learning Environments (IJVPLE)*, *12*(1), 1-16. https://doi.org/10.4018/IJVPLE.2022010102

Dabbagh, N., & Castañeda, L. (2020). The PLE as a framework for developing agency in lifelong learning. *Educational Technology Research and Development*, *68*(6), 3041-3055. https://doi.org/10.1007/s11423-020-09831-z

European Union. (2018). *Key Competences for Lifelong Learning* (p. 104) [Proposal for a Council Recommendation]. European Commission.

Jääskelä, P., Poikkeus, A.-M., Vasalampi, K., Valleala, U. M., & Rasku-Puttonen, H. (2017). Assessing agency of university students: Validation of the AUS Scale. *Studies in Higher Education*, *42*(11), 2061-2079. https://doi.org/10.1080/03075079.2015.1130693

Networked Learning Editorial Collective (NLEC). (2020). Networked Learning: Inviting Redefinition. *Postdigital Science and Education*. https://doi.org/10.1007/s42438-020-00167-8

Sagitova, R. (2014). Students' Self-education: Learning to Learn Across the Lifespan. *Procedia - Social and Behavioral Sciences*, *152*, 272-277. https://doi.org/10.1016/j.sbspro.2014.09.194

Tur, G., Castañeda, L., Torres-Kompen, R., & Carpenter, J. P. (2022). A literature review on self-regulated learning and personal learning environments: Features of a close relationship. *Interactive Learning Environments*, *0*(0), 1-20. https://doi.org/10.1080/10494820.2022.2121726