

Analysis of the Future Professionals' PLEs as Lifelong Learning Basic Skill: Presenting the CAPPLE Project

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Abstract

In this paper we want to present the CAPPLE Project, a research project centred on the exploration and understanding of Personal Learning Environments (PLEs). In understanding PLEs one can find out a deficit in fundamental research concerning the structure and composition of learners PLE in higher education. The CAPPLE Project addresses this issue by describing and analysing the prospects for the Personal Learning Environments (PLEs) of future Spanish professionals. It includes the analysis of this in technical, functional and graphical terms. The project is looking for the PLEs of the Spanish professionals with potentially an immediate incorporation into the labour market of every area of knowledge, in other words, senior students in Spanish universities. The main goal is not just to describe those PLEs, but trying to explore the underlying trends and models and, at the same time, discover the implications of these conclusions in the education in general and in the Spanish Higher Education Institutions, in particular. For its purposes, the project is using a mixed methodological approach. A variety of research methods such as expert discussions, survey, workshops, diagram analysis, is applied in order to provide a strong research perspective and guarantee solid research. CAPPLE project in its first version is working with fundings from the National Ministry of Economy and Sustainability for three years (2013-2016. project reference EDU2012-33256). This paper presents the CAPPLE project and gives an overview about the methodological approach, including tasks and the project schedule. CAPPLE is an ambitious, complex and multidisciplinary project. This project can have a direct impact on the fundamental research on PLEs (modeling, analytical tools, naturalistic evidence of their existence, and so on), as well as on institutional strategies surrounding them, both for initial professional learning and also basic education.

Introduction

The concept of PLEs gives everybody a background to reflect on the value of systematic organization and building of own environments to learn. PLE is an environment that will grow and continuously change throughout life. The basic idea is quite simple. If teachers teach students how to learn habitually on the Internet (continuously building, managing and improving their PLEs), students will continue developing themselves professionally and personally, in their jobs, workplaces and even at home. Consequently, formal learning – and universities in this case - must offer to students opportunities to adapt the “official” learning environments implemented in institutions to their own training needs. In parallel, institutions have to provide students with the necessary skills for managing and enriching their own personalized environments to learn. The research question followed in this paper is what kind of strategies students use to organize their PLEs and which strategies come from formal learning? With the description and analysis of the current PLEs of future professionals, the aim is to understand what kind of transversal learning contributes to the creations of PLEs. Answering this question allows to better understand the processes of creation, management and enrichment of PLEs, as well as which strategies can be applied to improve these processes in formal education. We understand PLEs are key elements of citizen’s learning development, as well as a crucial part of a citizen’s digital identity and lifelong learning competence. The CAPPLE project is funded by the National Minister of Economy and Sustainability for three years (2013-2016). This paper gives an overview about the state of the research in the first project year.

Objectives of the project

The CAPPLE project – <http://www.um.es/ple> - is called after its initials in Spanish:

"Competencias para el aprendizaje permanente basado en el uso de PLEs (Entornos Personales de Aprendizaje): análisis de los futuros profesionales y propuestas de mejora", i.e.:

"PLEs (personal learning environments) based lifelong learning skills: analysis of future professionals and suggestions for improvement", is a national funded project (EDU2012-33256 Ministry of Economy and Competitivity) in which we attempt to describe and analyse the prospects for the personal learning environments (PLEs) of future professionals. It includes the analysis of this in technical and functional terms, learning strategies, experiences, resources and tools associated. The project is studying professionals with potentially an immediate incorporation into the labour market of every area of knowledge, in other words, senior students in universities or vocational training.

Taking into account the current situation of education systems as well as the state of research in this regard, the overall goal of CAPPLE project is the description and the prospective analysis of Personal Learning Environments (PLEs) of the Spanish future professionals in all areas of knowledge. The aim is to understand how these environments are built, what are their characteristics, what strategies have been used to set them up and which ones are associated with formal education as well as what type of cross training deficiencies can be detected. A better understanding of the processes of creating, managing and enrichment of PLEs would stimulate the development of strategies to improve the empowerment of students to create PLEs in formal education, understanding that these are key elements of the educational development of citizens, their digital identity and its life's long learning skill.

This overall goal can be broken down to the following objectives:

1. Describing specific strategies and tools used routinely by senior university students from all areas of knowledge to enrich and manage their learning, inside and outside the classroom.

Especially those that take place in online contexts.

- Designing a reliable and valid instrument for collecting information about the strategies and tools used by the students to manage and enrich their learning, inside and outside the classroom, especially in online contexts. These includes tools and procedures to acquire, manipulate and recreate information individually as well as collectively, and strategies, tools and processes to share.
- Describing and classifying learning strategies used by students (self/targeted professional/personal, formal/non-formal/informal) and how students perceive its relevance.
- Identifying and categorizing ICT tools used by students to learn, both from its technological aspect (social media, social networks, aggregators, free/owners) as well as in its functional aspect (publishing tools for collaborative knowledge creation, reading tools, multimedia information sources).
- For precising if each network tools and learning strategies are used with a specific function or if used with various functions in different contexts.

2. Analyzing, both technically and functionally the personal learning environments (PLEs) of the Spanish future professionals from all the knowledge areas.

- Describing and modelling types of Personal Learning Environments (PLEs) that appear among the students surveyed.
- Identifying parts of such environments and the most common components of these PLEs.
- Examining the level of awareness that students have about their learning processes and their own personal environment.

3. Achieving a joint analysis of both the components and the models obtained and its educational implications regarding the improvement of strategies aimed at enriching the process of creating and managing PLEs for future professionals the university.

- Analyzing the degree and type of influence given by the students to the formal educational institution (the university) as provider of these strategies and described environments, as well as analyzing which of these are perceived by future professionals as acquired in parallel, transverse or tangential to the university.
- Analysing the differences between the different knowledge areas about the models of PLEs found, as well as the strategies and tools contained therein.

- Identifying the educational implications on initial training regarding the elements and the models found.
- Identifying, based on student responses, cross-cutting strategies (technological and training) which would be implemented by Higher Education institutions for the enrichment of the PLEs of future professionals.
- Making proposals for concrete strategies (technological and training) to be carried out from university contexts to enrich the process of creating and managing the PLEs of future professionals.

4. Disseminating the data and conclusions of the project and proposing the extension of its scope not only the Spanish university, but to the European and international contexts both in terms of the data being obtained in progression, as the most important conclusions the project itself.

Methodological approach

This project underlies a very complex research process, not only because we are working in an "emergent" field and with an emergent concept of PLE in terms of Veletsianos (2010), but also because following the Cinefyn Framework by Snowden & Boone (2007) we are trying to analyse a very complex context: the university initial education, where definitively "right answers can't be ferreted out" (Snowden & Boone 2007, p. 3). We could include this project in which MacMillan & Schumacher (2001) called applied research, i.e. research that "focuses on a practice field and is concerned with the development and application of knowledge gained in the inquiry into the practice" (MacMillan & Schumacher 2001:23). Specifically, in this research we focus on the study of educational practices (learning practices, to be precise) of future Spanish professionals or, what is the same, senior university students. We are going to analyze their practices to learn, and from those practices, we want to explore the empirical and analytical relationships that could exist and would allow us to draw some inferences about these particular realities in the broader scope of our study group.

The approach of this study is a mixed approach, basically because what we want to study, and how we intend to do, corresponds to two approaches (MacMillan & Schumacher 2001):

- A non-experimental quantitative approach in which we try to describe, compare, and correlate the strategies and tools used by future Spanish professionals to learn (objective 1 and a part of the objective 2)
- A non-interactive qualitative approach, in which we also intend to analyze and understand how these strategies and tools are configured, in specific models of personalized learning environments -one for each person probably, and can also explain more generalized trends, associating some to the learner characteristics: its region, age or area of knowledge (goals 2 and 3 of the project).

Consequently, in this research we opted for a design with a mixed methodology, i.e. utilizing a qualitative and quantitative approach, both the data collection and the analysis of them, combining these data and analysis, or using them, sometimes for parallel and sometimes sequentially (Tashakkori & Teddi 2003). Even if taking a varied approach to the object of study makes it more complex, we opted to retain this mixed approach because of the advantages of such an approach. According to Newby (2010) these advantages are:

- More and better chances of triangulation of data, by resorting to various ways of getting data and diverse sources as well, getting not only the measure of anything, but an appreciation of this phenomenon or reality (Newby 2010, p. 128).
- More and better options to unravel and deploy the object of research. This is especially helpful in the case of complex processes that must be unravelled for a better understanding, in this specific case self-regulated learning processes and personal learning environments.

Furthermore, we understand that it is crucial in this research where will require a display of the same sample, where we try to modeling particular types of PLEs that we will find, as well as when we enter the part of educational and institutional implications, the redefinition and refinement of the research will be desirable. So, as Newby (2010) explains, this type of approach increases our chances of doing so.

Principal tasks

The project objectives explore the object of interest, and describe various lines of work around these future professionals. Based on the objectives, there are four phases in our research:

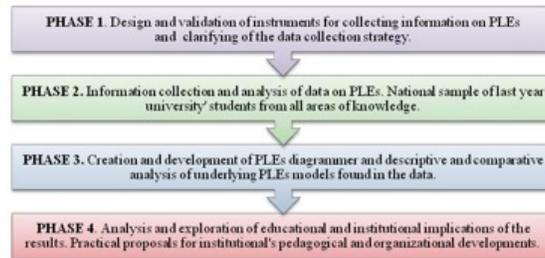


Figure 1. CAPPLE Project phases.

These phases cover all the objectives and based on the methodological approach includes the following major tasks:

Task 1, Phase 1: Design and validation of instruments for collecting information on PLEs: If we try to analyse PLEs from a pedagogical perspective as personal learning approaches, we must begin from a clear perception about what a PLE is and what the mechanisms of learning that are working behind the PLEs are. Based on the available literature in the field, and taking into account the lack of unity on the definition of the PLE concept (Buchem, Attwell & Torres, 2011), we decided to follow the PLE definition by Castañeda & Adell (2010) as a conceptual base. Castañeda & Adell (2010) define PLE as "a set of tools, data sources, connections and activities (experiences) that each person use habitually to learn" and includes. Our conceptual based includes the proposal of Attwell (2008), in which PLEs include tools, data sources, connections and activities for reading (in multimedia), reflecting and doing, and sharing. Based on the definition and the PLE structure as proposed by Castañeda & Adell (2012) and Castañeda & Adell (2013), PLEs mean the

knowledge mechanisms that every person uses to learn. The crucial parts and components of PLEs are shown in Figure 2.

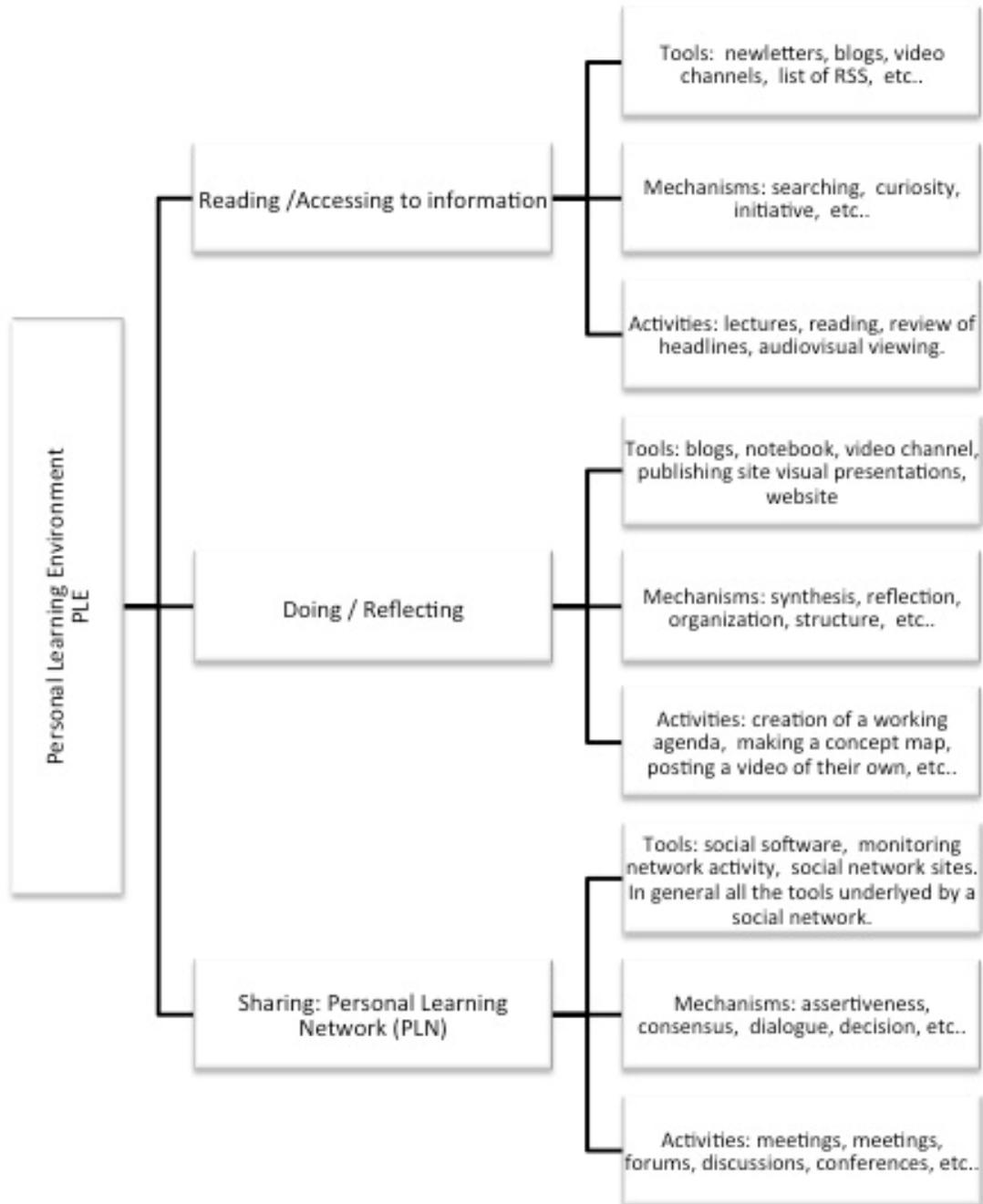


Figure 2. PLE Components (Castañeda & Adell, 2013:20)

Consequently, if in this project we try to analyse PLEs, we understand we must build an instrument for collecting data about these components. We also understand that the data collection couldn't be only centred on the "isolated" components, we need something that would provide us some structure to this information; so, we understand that the data collection must recover information close to what Boekaerts (1997) called "the self-regulated learning strategical components".

The main idea is not to use those concepts (self-regulated learning and this particular PLE's definition) as a fixed framework, but as discussion starters. In the project, a group of experts (the project team) is going to develop a model of understanding that will be used as a base for creating the self-administrated survey. The survey will be used as a principal data collection instrument that, for reliability, accessibility, ease of use and ease of treatment, will collect a wide range of data. After the survey design, the validation of the instrument will be carried out in four phases:

- Expert review: A final review of the elements and categories included in the survey, as well as the scales and structure of it.
- Cognitive interviewing: As Dillman (2007, p. 143) remarks, "cognitive interviewing has been developed determining whether respondents comprehend questions as by the survey sponsor, and whether questions can be answered accurately". It is a very simple technique that can provide information to explore.
- Pre-test piloting: Piloting will be carried out with a pilot sample of 250-300 senior university students from the 5 areas of knowledge described by the Spanish Ministry of Education: Arts and Humanities, Science, Health Sciences, Social Sciences and Law, and, Engineering and Architecture.
- Factor analysis: This analysis will try to reinforce the validity and reliability of the questionnaire elements related to its theoretical bases.

Task 2, Phase 2: Exploration and statistical analysis of the components of PLEs of senior students in Spanish universities. In this phase the main task includes the exploration of

the current state of PLE components and associated mechanisms of the senior students in Spanish universities. After the validation process, the main collection of data will be carried out using the survey with a sample of approximately 1.500 students (for a 95% confidence level), from a total study population of 250.000 students. Even if we cannot work with a totally random sample, in order to guarantee the representativeness of survey data we will work with a stratified sample collected in the different regions of the country. After the collection of data, the first analysis will be based on the statistics that could give us some information about how our senior students - future professionals - learn and organize their learning. In this part we have planned not just a “critical reading” of the statistical report, but organizing some focus groups with experts (divided by geographical zones), to analyse the data, from the general educational perspective, as well as from the Higher Education institutional perspective.

Task 3, Pasa 3: Diagraming PLEs and understanding the underlying models. In order to go deeper in the exploration of other ways for analysing PLEs, in this project we are going to analyse PLEs, also, from the graphical point of view. Following some studies conducted before by other authors (e.g. Willson, 2008; Casquero et al. 2010, Casquero, 2013, among others), we consider PLE diagrams as an important research aspect. Therefore, in this project we have proposed the creation of a tool - the PLE's diagrammer - for collecting information and automatically providing the graphical representation of PLE based on this information. Consequently, during the data collection process (included in the task 2) and using the theoretical model and the survey developed as theoretical framework, we are going to develop a PLE Diagrammer Software. Once the whole data (task 2) is collected, we will resample these – at this time randomly - and enter these sampling data into the diagrammer. The main idea is to obtain a graphical representation of the existence and nature of PLE

components, as well as the relationships between them. Then, the diagrams corresponding to the resample data- will be analysed, first in small groups by some experts, and then together in a greater group of discussion. The idea is trying to detect PLE graphical models if there, trends, special relationships between concepts, mechanisms, even styles related to gender, area of knowledge and so on. Additionally, after the analysis, if the developed tool and the conclusions are relevant, we have the intention of making the tool accessible to public in the Web, as a mechanism for self-evaluation and improving own PLEs.

Task 4, Phase 4: External analysis, models catalogue and institutional implications of data. The final part of the project will have a wider and global perspective of the preliminary conclusions we have obtained on the previous phases. We consider crucial that, after some particular analysis it must be done a global one, which could relate every part into usable conclusions, for research, for educational practice, as well as for the theoretical framework of the field. For this part of the project, we will work, not only with the panel members of the research team, but with a group of international experts who act as the project's international advisory board.

In addition, this discussion will be held in parallel in Spanish and English, trying to get the most out of the skills of our experts. It is expected that the analysis will be done over in two face to face working days with 3 main sessions: a discussion session in English, Spanish discussion session and a plenary session. The idea is that experts will meet them in two consecutive groups of work; a discussion group in English, and a discussion group in Spanish. Therefore, researches will be assigned to a discussion group mainly decided based on which language is more comfortable to engage in a discussion of this draft. All experts may attend the two sessions of discussion, but in one of them they could just participate as a spectator. Thus, the two discussion groups have different members, with only two exceptions:

one of the researchers of the core group, which will act as coordinator of the meetings, moderator and facilitator, and another, which will act as rapporteur and documentary of the same.

In these discussions we will not only discuss the PLE modelling analyses made in the previous phase, but since all the findings also have phase 2, we will address in the discussion groups which are the educational and institutional implications and important conclusions we have reached with the data. Later there will be a plenary session work (with both groups), which will contain the conclusions of both arguments. At the same plenary meeting, and once exposed the conclusions, we will create working groups to draft and document a catalogue of models and their components as well as the proposals and implications suggested by the group. These new working groups will be coordinated by researchers, that will feature the work of others not attending the same. Additionally, we try to include in this new analysis practical proposals consistent with the conclusions we have obtained. This is the time to emphasize that we do not understand the goal of this project to develop a model catalogue of desirable or good PLEs, but to try to analyse what PLE models are used by current and future professionals and to provide explanations, suggestions and proposals about what this means in the face of education and formal training.

In order to achieve every objective -and task- in the three years period of the project, we have programmed some periods only dedicated to one phase or main task - for concentrating our resources and efforts - and some periods with activities in parallel. The schedule is described in Table 1.

		Phase 1 Main Task 1	Phase 2 Main Task 2	Phase 3 Main Task 3	Phase 4 Main task 4
1st Year	1st Sept.	Theoretical Model's definition			
	2nd Sept.	Data collection Instrument and Strategy D: Questionnaire's draft Pretest. (Cognitive Interviewing (crucial items) & Piloting: 250 n) D: Questionnaire	Sample definitive size		
2nd Year	1st Sept.		Data Collection: Sample 1500 n D: +1500 filled questionnaires	PLE Diagrammer: Design and development. Web tool	
	2nd Sept.		Statistical Analysis of Data D 1st Data Analysis Analysis and Conclusions D: Future professionals' PLEs, Tools, Strategies and mechanisms used by senior students to learn. Preliminary Conclusions		Re-sampling for diagramming and data collection
3rd Year	1st Sept.			PLEs' Diagram Analysis (1st part): Internal Reflections and Modeling (1st part) D: PLEs Models Catalogue.	
	2nd Sept.		Institutional Implications for Spanish Universities	Institutional Implications for Spanish Universities	PLEs' Diagram Analysis (2nd part): External Reflections and Modeling (1st part) D: PLEs Models Catalogue.
		Conclusions Educational General Implications			

Table 1. CAPPLE Project Schedule

Current and future steps

At the moment of writing this paper, we are still in the middle of the first phase. We have just started the questionnaire validation process, so we do not have data for sharing yet. We are in the middle of an ambitious, complex and multidisciplinary project that we firmly believe that may have impact on both fundamental research in this field (with modelling PLEs, the creation of a tool for analyzing and diagramming them, over and above the empirical evidence of the PLE's nature), as well as institutional applications of its findings to the initial vocational training strategy, and why not, even basic education.

We think it's an innovative proposal and intends to take another step in research on PLEs. We actually don't know much about how will be the end of this research, we are trying to learn and improving it day to day. That is the challenge that we propose and we present it to you for continue discussing and learning.

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