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Paz Prendes

Linda Castañeda

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# PLE-CENTERED EDUCATION: THE NEXT BOUNDARY. PERCEPTIONS AND REALITIES BEHIND STUDENTS PERSONAL LEARNING ENVIRONMENTS

*by Paz Prendes & Linda Castañeda*

## **Abstract**

In this paper the authors discuss the results and implications of research regarding the building and perception of Personal Learning Environments (PLEs) that they developed in the last four years. In addition, the authors discuss the next step of this research; the public funding project CAPPLE, on which they are currently working.

## 1. Discovering Personal Learning Environments (PLEs)

*Listen to Paz Prendes & Linda Castañeda, Department of Didactics and School Organization, University of Murcia, Spain, discuss PLE Centered Education.*

Human beings definitively are learning beings. For us, the learning process is constant and ongoing, even when we are unaware. Technology related to Web 2.0 features social networking, mobile technologies, ubiquitous connections, rapidly changing our lives (Downes, 2010). These changes have altered the role that information plays in our lives, and how this information must be discovered, analyzed, shared, and used for every activity we do (Attwell, 2007). Nevertheless, the technologies in this complex field we call Information and Communication Technologies, or ICT, are no longer the only way to deliver information; they have configured themselves around our activities, our environments, and our relationships between information and us, similar to our relationships between other people (Downes, 2010). Indeed, these technologies have configured a crucial part of the environment around us. We are residents with technologies, not visitors any more (White, 2009).

Obviously, all these changes have a critical impact on the conception of the learning process (Torres Kompen et al., 2008) that today, more than ever, must not be limited to classrooms. Informal learning processes enrich our initial, professional, and lifelong learning processes (Costa, 2010). As a result, informal learning is embedded in our formal environments for working and living (Cross, 2010). In this crucial socio-

technological moment, research on PLEs has emerged in one concept; the processes, strategies, and technologies we use for learning.

In the last few years, the authors along with other researchers have explored PLE research from a variety of points of view. The journey of the researchers can be divided in two complementary perspectives: the work around the PLEs' conceptual definition and the analysis of learners' PLEs in different learning environments. These two visions have provided the researchers with a sequential perspective about the development of this field and resulted in the proposal of the public funding project the authors are currently working on and that will be discussed in the final part of this paper: The CAPPLE project.

## 2. Conceptualizing Personal Learning Environments

The first study regarding PLEs (related to the iCamp project, described in the next section) revealed concerns about the lack of transparency in PLE conceptualization. At that point, even when the literature provided some interesting approaches to the nature, technological development, and implications of PLEs (Attwell, 2007, 2010; Friedler, 2007; Krieslinger y Gillet, 2008; Waters, 2008) none of these provided a clear definition of PLEs from the pedagogical perspective. This made the development of more profound studies of the topic very difficult.

Based on the available scientific literature related to PLEs, as well as experiences carried out in the university environment, the authors decided to develop a clear definition of a PLE (Adell & Castañeda, 2010), concluding that a PLE is: "a set of tools, data sources, connections and activities (experiences) that each person habitually uses to learn". According to this, and following the Attwell (2008) proposal, the authors concluded that there were three crucial parts or components of this environment: strategies and tools for reading: the sources of information to which there is access and which serve as a cultural artifact (media library); tools and strategies for writing/reflection defined as the environments or services in which an individual can transform information after reflection (sites for writing, commenting, analyzing, recreating and publishing information), tools and strategies for sharing described as environments where an individual interacts with others with which they learn (Adell & Castañeda, 2010). The third part of this structure described the social learning environment of every person, also called the Personal Learning Network (PLN), the most crucial part of a person's PLE, especially in terms of professional development and lifelong learning (Castañeda & Adell, 2011).

Nevertheless, after much work with students and professionals regarding the development of PLEs (Castañeda & Adell, 2011), as well as studies on the nature of the elements included in the PLEs of teachers, professionals, and students (Castañeda & Adell, 2012; Castañeda & Soto, 2010; and Castañeda, Costa & Torres-Kompen) the authors introduced another element to the PLE perspective that suggested the

importance of strategies for learning: the PLE elements and the mechanisms of thought for each component of learning. Currently the authors believe, the PLE's structure includes a unique set of components (see Figure 1). Nevertheless, this is only one route the authors explored, influenced by studies on the reality and practice of PLEs were also conducted.

### 3. Using Web 2.0 for learning: PLEs in action

In the past few years, the authors tried to analyze the nature of PLEs (Adell & Castañeda, 2010) and how students could create and perceive their PLEs from the technological point of view as a crucial part of their lifelong learning skills (Castañeda & Sanchez, 2009; Castañeda & Soto, 2010). They also analyzed how students integrate tools associated to day-to-day learning processes (Castañeda & Adell, 2012). Additionally, the authors explored how teachers could introduce PLE development strategies for their students (Castañeda & Adell, 2013) and how they could use social media tools as a crucial part of their own professional-development (Castañeda & Adel, 2011; Castañeda, Costa & Torres-Kompen, 2011). All of these studies have been based on naturalistic samples from real learning and teaching experiences.

#### **The First Approach: The iCamp Project**

In 2008 we participated in the ICamp Project (<http://icamp.eu/index.html>), one of the first European research projects to explore in practice and a pedagogical point of view and the possibilities of Web 2.0 for redefining higher education students' learning environment. Until then, even when some authors had remarked on the importance of understanding PLEs as a pedagogical approach rather than a technological tool (Attwell, 2007, Daniels & Carneiro, 2008), the principal approaches to the term had been demonstrated in the technological environment (Severance, Hardin y Whyte, 2008).

On the third trial of this project, the authors analyzed how students redefined the technological learning environment utilized for passing a formal course (i.e., master's courses), starting from a technological environment provided by course coordination and some tools provided (recommended) by their facilitators, and depending on their reference group's activity, as well as the character and characteristics of the group's facilitator (Castañeda & Sanchez, 2009) (Figure 2).

The results of this exploration have revealed evidence of the creation of PLEs when the authors provided higher education students the possibility of controlling at least a part of their experience in a course. In addition, this research has made evident the existence of Community Learning Environments, understood as the learning environment used and customized by groups for learning interchanges in the same contexts (see Figure 3).

## **Patchworking PLEs**

In 2009-2010 the authors developed a teaching experience of the introduction of ICT to higher education students in a complementary professional approach and a PLE-development approach (Castañeda & Soto, 2010). In order to study this experience, we collected from our students their particular vision of their PLEs in diagrams they had built during the course (see Figures 4 and 5). In terms of learning, this study confirmed that students appreciated new ways of developing their tasks and their coursework, even when the majority of students associated learning only with acquiring information and some associated learning with memorization.

In terms of technology, after this experience the authors concluded that students, when arriving at the university, had no experience, or knowledge in the use of ICT tools. In addition, students from the first year of the degree did not think they used Web 2.0 (awareness), and even more, they did not believe that they used ICT tools for learning, even if they actually did. They valued useful tools which helped them plan their tasks, save time, simplify complicated tasks, and, definitively, have fun; but also they especially valued the ICT tools they discovered that showed opportunities for independence, collaboration, and self-importance in the learning process. The vast majority of students had a basic perception of their PLE; few of them did not relate tools with themselves but with their tasks; and only some of them went one step further by establishing more complex relationships between tools, contents, tasks, and self enrichment.

## **PLN as the Crucial Part of PLEs, and Twitter as the Core**

The next step in our exploration of PLEs was analyzing the Madhouse of Ideas Project's contents (Castañeda, Costa & Torres-Kompen, 2011). The objective was to analyze how concepts such as PLE and PLN appear, when and if they do in the stories of the Madhouse of Ideas (<http://www.madhouseofideas.org>). We considered all of them to be case studies, and the stories offered for the Madhouse project as a storytelling collection.

From the data we had at that time, and the kind of analysis the authors completed, we came to the conclusion that Twitter was perceived more as a platform for social learning and a channel for collective sharing than a platform for personal expression. In a clear coincidence with Simoes (2010), people included in their stories testimonies regarding their experiences of sharing and supporting social learning; only a few mentioned other learning activities.

In this study we found more evidence of “social learning” than “personal learning,” but we found as well support for the idea that there are implicit relationships between both of them. Social learning is supported by PLNs as structures, and these networks are crucial parts of PLEs. Consequently, this evidence around social learning and PLN was in the end evidence of stories about learning and about PLEs in the context of Twitter. In addition, there was some evidence in the analyzed stories regarding some features

that definitively affected learning processes but were not directly related to learning. For example, how Twitter adds a social element to another tool, how Twitter could be the entrance to the condition of a resident on the Web (White, 2008), and how it could diminish feelings of isolation and improve empathy between participants.

### **Exploring Deeply, Learning Processes Behind PLEs:**

The last study conducted before starting the current project was in 2012. For this experience (Castañeda & Adell, 2012), the authors tried to analyze the learning processes behind the course activity of students in the first year of a degree program in the period 2011-2012. For this purpose, mind maps of their learning activity (not just technologies, but cognitive processes used) were collected and analyzed along with the content of those maps, using categories related to the PLE components previously identified: reading, doing/reflecting, and sharing (Castañeda & Adell, 2010)(see Figure 6).

According to the data collected in this study (Castañeda & Adell, 2012), the authors concluded that PLEs include, technologically supported processes and non technologically supported processes, and in the majority of cases both were revealed as mutually complementary. This fact actually suggested the nature of the PLE not as a technological tool but as a pedagogical approach with a hard technological base.

The data revealed learning processes related to thinking and reflecting were not related to any technological tool, but learning processes based in actions or active roles of the learner were strongly related to technology. This relation could support the trend of including active learning methods as a crucial part of the emergent (in terms of Veletsianos, 2010) pedagogies in the current technological era.

Also, the study supported the idea of a very “uncritical” student. The teacher was considered as the only source for getting information; also, students did not see their peers as sources for recovering information or as complements to the lecturer sources. In the case of processes related to *sharing*, students gave little importance to this component of learning. In the diagrams, *sharing* was always the final part of the process, and it appeared only related to the artifacts that were part of the course assessment.

In addition, this study’s conclusions revealed that a student’s specific way to understand the learning process was also the result of the kind of activities students participated in through their educational coursework and that were also the result of a teacher’s educational, epistemological, and cultural beliefs about learning and education.

## **4. The Next Step: The CAPPLE Project**

As previously stated, the current technological environment provides learners, more than ever, with the opportunity of building a technology enhanced environment that is networked and enriched by the interaction of other people and controlled by them. Potentially, everyone could include, organize, and manage their informal, formal, and nonformal learning resources, tools, and experiences ( Adell & Castañeda, 2010;Attwell, 2007;Buchem, Attwell &Torres Kompen, 2011) in order to expand their learning opportunities.

However, as the authors tried to reflect in the research previously described, from the practical point of view, even when some studies previously analyzed how learners integrate technologies into their PLE and how they use those technologies (Casquero et al., 2011, Castañeda & Soto, 2010; Castañeda, Costa & Torres Kompen, 2011;Salinas et al, 2011;), those studies provided a technological perspective of the object of study. Even so, if individuals understand PLEs as a pedagogical approach with a strong technological base, this technological perspective of analysis needs further development (Castañeda & Adell, 2013). Consequently, we continue our research in the next step (Prendes, 2013).

The CAPPLE project ([www.um.es/ple](http://www.um.es/ple)) is named 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,*" which translates as "PLEs (personal learning environments) based lifelong learning skills: analysis of future professionals and suggestions for improvement". CAPPLE is a nationally funded project in which the authors attempt to describe and analyze the prospects for the PLEs of future professionals. It includes the analysis of PLEs in technical and functional terms, learning strategies, experiences, resources, and associated tools. The project studies professionals, but it has potential to be incorporated into the labor market of every area of knowledge; senior students in universities or vocational training.

As clarified in the previous sections of this paper, the authors considered that the concept of PLEs provided everyone a background to reflect on the value of systematic organization and promotion of the building of their own environment to learn (Atwel, 2007; Castañeda & Adell, 2013) that would grow and continuously change throughout a person's life. The basic idea is quite simple. If, as teachers, we teach our students how to habitually learn on the Internet, continuously building, managing and improving their PLE, they will continue developing themselves professionally and personally in their jobs, workplaces, and even at home. Consequently, we understand that formal learning must offer students opportunities to adapt the "official" learning environment 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 learning environment. Therefore, with the description and analysis of the current PLEs of future professionals, the authors want to understand these environments and in addition, the authors want to understand these environmental features as well as the kind of strategies students have been using to organize them. We also seek to know if some of these strategies come from formal learning, and if not,

what kind of lack of transversal learning made them evident. All of this information has allowed the authors to understand the processes of creation, management, and enrichment related to PLEs, as well as to better know the strategies to improve these processes in formal education. We understand that PLEs are key elements of a citizen's learning development, as well as a crucial part of a citizen's digital identity and lifelong learning competence.

Taking into account what has been raised previously in terms of the current situation of education systems and their protagonists, as well as the state of research in this regard, we considered the overall goal of the CAPPLE project to be the description and the prospective analysis, both technically and functionally, of PLEs of future Spanish professionals in all areas of knowledge. Our aim is to understand how these environments come to be, what their characteristics are, what strategies have been used to set them up, and which are associated with formal education as well as specific type of cross-training deficiencies. This will allow the authors to understand the processes of creating, managing, and enriching PLEs that would stimulate the development of strategies to improve their empowerment from formal education and to understand that these are key elements of the educational development of citizens, their digital identity, and their lifelong learning skills.

This overall goal utilizes the following objectives:

1. Describe 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.
  - Design 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; that is, tools and procedures to acquire, manipulate, and re-create information individually as well as collectively, and the strategies, tools, and processes to share.
  - Describe and classify learning strategies used by students (self/targeted professional/personal, formal/non-formal/informal) and how they perceive its relevance.
  - Identify and categorize ICT tools used by students to learn, from its technological aspect (social media, social networks, aggregators, free/owners, and so on) and its functional aspect (publishing tools for collaborative knowledge creation, reading tools, multimedia information sources, and so on).
  - Determine if each network's tools and learning strategies are used with a specific function or if they are used with various functions in different contexts.
2. Analyze, technically and functionally, the personal learning environments (PLEs) of the Spanish future professionals from all the knowledge areas.



- Describe and model types of PLEs that appear among the students surveyed.
  - Identify parts of such environments and the most common components of these PLEs.
  - Examine the level of awareness that students have about their learning processes and their own personal environment.
3. Achieve a joint analysis of both the components and the models obtained and their educational implications regarding the improvement of strategies aimed at enriching the process of creating and managing PLEs for future professionals in the university.
- Analyze the degree and type of influence given by the students to the formal educational institution (the university) as a provider of these strategies and describe environments, as well as analyzing which of these are perceived by future professionals as acquired in parallel, transverse, or tangential to the university.
  - Analyze the differences between the different knowledge areas about the models of PLEs found, as well as the strategies and tools contained therein.
  - Identify the educational implications on initial training regarding the elements and the models found.
  - Identify, 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.
  - Make 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.
  - Disseminate the data, develop conclusions and propose the extension of its scope not only to the Spanish university, but also to the European and international contexts both in terms of the data being obtained in progression as the most important conclusions the project itself.

These objectives explored the object of interest and described various lines of work around these future professionals. Based on the objectives, it is evident that there are basically four phases in our research and the authors are currently in the middle of the first phase (see Figure 7).

This research and other studies completed by other authors whom we have had the opportunity to read and discuss has led us to our current project. This is an ambitious, complex, and multidisciplinary project that the authors firmly believe may have impact on 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 their nature) and the institutional applications of its findings to the initial vocational

training strategy and even basic education. The authors believe it's an innovative proposal that takes another step in the research on PLEs.

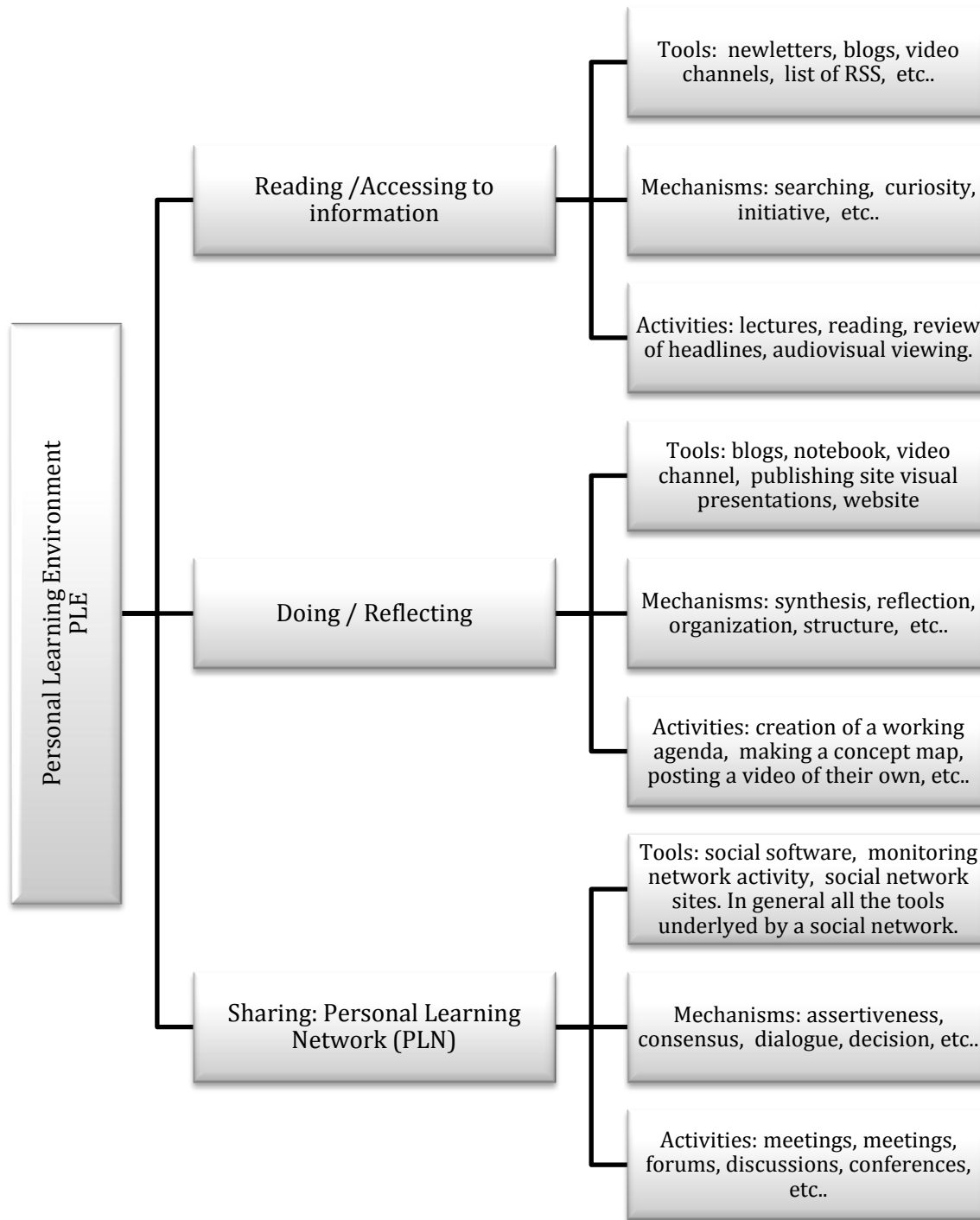


Figure 1. PLE Components (Castañeda & Adell, 2013, p. 20)

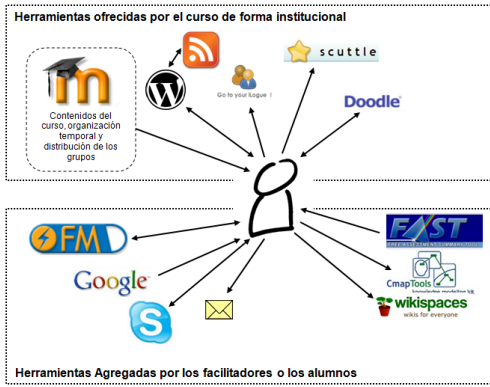


Figure 2. Student B3's Learning Environment (Castañeda & Sanchez, 2009, p. 187)

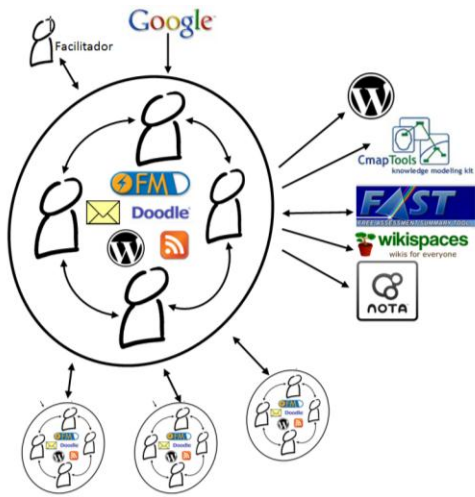


Figure 3. Group B's Learning Environment (Castañeda & Sanchez, 2009, p. 188)

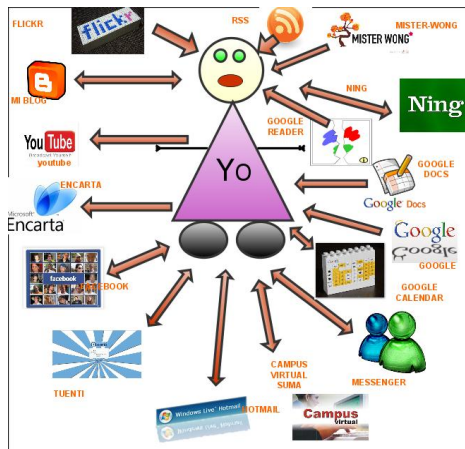


Figure 4. Student PLE Diagram (Castaneda & Soto, 2010)



Figure 5. Students' PLE Diagram (Castañeda & Soto, 2010)



Figure 6. PLE Mind-map (cognitive processes and technologies related) (Castañeda & Adell, 2010)



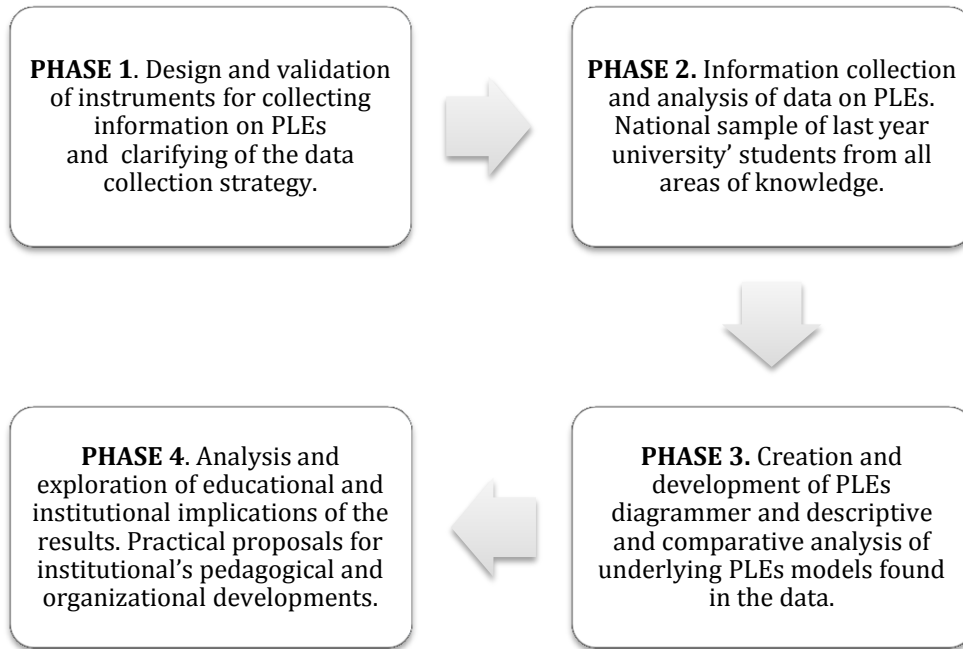


Figure 7. CAPPLE Project Phases

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