Still far from personal learning: Key aspects and emergent topics about how future professionals' PLEs are

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Abstract

The CAPPLE project is an exploratory research project that aims to analyse the PLEs of future Spanish professionals. An ad-hoc survey about their habits for learning was conducted using a sample of 2054 university students from the last year of a degree. After data collection, two main processes were carried out: (1) the analysis of some of the aspects learnt through the data collection; and (2) a series of focus groups in parallel, centered on the exploration of data to obtain some first conclusions with a descriptive analysis. The results of these processes showed firstly, that although the survey size is important, there are other factors to consider, such as the difficulty and constant engagement of questions, which that seriously affected the rate of survey completion. Additionally, data show that future professionals prefer to use analogical tools to complete their learning tasks although they like being connected to social networks in their social lives. They do not have many strategies to organize their learning and are not very critical of the information that comes from their teachers. Regarding PLEs, there are some topics that emerge from the analysis that should be studied in the next future in order to understand better how our students - our future professionals- learn.

Keywords

Personal Learning Environment, Self-regulation strategies, Higher Education, Spanish survey.

I. Introduction

Almost a decade after the first papers on Personal Learning Environments (PLE), there has been an incredible improvement in technologies related to learning and teaching. Also, the academicliterature on PLE has increased manifoldly (for example Buchem, Attwell & Torres, 2001; Fiedler & Väljataga, 2013; Cabero-Almenara & Vázquez-Martínez, 2014; the works included in the monograph coordinated by Coll & Engel, 2014; Gallego-Arrufat & Chaves-Barboza, 2014; Shaikh & Khoja, 2014; Chaves, Truijillo & López, 2015). Nonetheless, it is still a challenge to study them with the main goal of understanding better how they apply to the learning reality, or rather, to the learner's reality.

PLE has become more than an approach to how people learn. We can find a technological approach where PLE is overall a combination of learning tools, services and artefacts in a single space organized by the student (Mödritscher et al., 2011) or we can support the concept in the pedagogical approach which understands PLE as information processing, people connections and knowledge creation in order to place students at the center of the learning process (Torres & Mobbs, 2008). This second model is near to ours in the CAPPLE Project.

It is a way of understanding the learning process itself, as well as how the elements regarding learning and education are related each other, or how the synergies among them could interact in different contexts or be integrated into the lifelong learning process. In this sense, the conceptual revision of Dabbagh & Kitsantas (2012), authors who define PLE as strategy to understand and promote formal, informal and self-regulated learning of students, is of great interest. They also emphasize the relevance of social media in sharing learning achievements and making sense of them.

However, the studies on PLE are still very limited and there is a lack of significant studies that would help researchers to visualize the main issues that the future analysis work regarding PLE should centre on. Moreover, taking into account that these studies must conserve the importance of interpretation (Stake, 2010), from the understanding that this is the only way to expand the exploration of something complex and tangled, using the usual research methods.

This article is intended as an update on the progress made in the CAPPLE project so far. It shows the key data and the first conclusions of the statistical analysis based on the description of frequencies and percentages. In order to organize the process and extract the greatest profit from the large amount of data, we have designed a task with four focus groups. Each had to study in depth one of the dimensions of the questionnaire and this article explains the process.

First, the focus groups sought to highlight some problematic aspects (regarding the sample, the methodology, the data, and so on) that should be taken into account before carrying out a more in-depth analysis. They also identified emerging research topics that should be addressed, if possible, in the next phases of the project, or that should be suggested, as successive research fields for future studies and projects.

a. The road until here: CAPPLE Project

The CAPPLE project[1]is a four-year Research project funded by the National Ministry of Economy and Sustainability over (2013-2016 Project Reference EDU2012-33256) and it is coordinated by Author 1 from the University 1 (Author 1, 2015). Its name comes from the initials of its name 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: "Lifelong learning skills based on PLEs (personal learning environments): analysis of future professionals and suggestions for improvement". This project includes the analysis of PLEs of senior university students in technical, functional and graphical terms, always understanding that PLE is a pedagogical concept that can help us to understand not only what tools people use to learn but also how people learn, in other words, their strategies to learn based on the use of telematic tools.

The project starts from the understanding that a PLE is: "a set of tools, data sources, connections and activities (experiences) that each person uses habitually to learn" (Adell & Castañeda, 2010, pp 23). Apart from that, PLE includes the thinking mechanisms that people use. This approach takes in the possibility of knowing the PLE could give everybody a background to reflect on the value of a systematic organization and promote the building of their environment to learn (Attwell, 2007; Author 2 & Adell, 2013).

After the definition of the model for analyzing the PLE in our CAPPLE Project (Author 1, Author 2, Ovelar & Carreras, 2014), the validation of the instruments (Author 1, Author 2, Solano, Roig, Aguiar & Serrano, in press) and the piloting of the survey, during the academic year 2014-2015 the project has collected the final sample from students studying at Spanish universities (Author 1, 2015; Author 1 & Gutierrez, 2015).

b. The Data Collection Process, Sample & Neglect

The CAPPLE project is an exploratory research that, from a naturalistic approach, aims to make a descriptive study (Cohen, Manion & Morrison, 2007). The population that constitutes the study is vast, as well as geographically dispersed in many different institutions, which made it difficult to access the research subjects and study their reality.

In consequence, this study has not used a probability sampling strategy -random sampling– but a convenience sample technique. Nevertheless, even though the questionnaire used to collect the information was a self-administered survey, the research team tried to disseminate the information about the study as much as possible.The objective was to maximize the participation of students, whose only requirement to participate was to bea final year degree student at a Spanish University.

The survey was administered online. First an email was sent to all universities (public and private), in which the study was explained and students were asked to participate. Then, the project sent an e-mail to all teachers who were lecturing in the last year of degree courses during this period; the email included the same information. Finally, the survey was advertised on the project website (http://www.um.es/ple), Twitter and Facebook.

[1] www.um.es/ple

CAPPLE Survey is a questionnaire that tries to collect information about how students in the last year of university, actually learn. In order to compile the questionnaire, a model was built within the project that understood the complex process of learning as being formed by certain elements, divided into categories.This model has been extensively explained in previous papers (Author 1 & Author 2, 2013; Author 1, Author 2, Ovelar & Carreras, 2014; Author 1, Author 2 & Gutierrez, 2014; Author 1 et al. in press) and in 0 the reader is presented with a general vision.

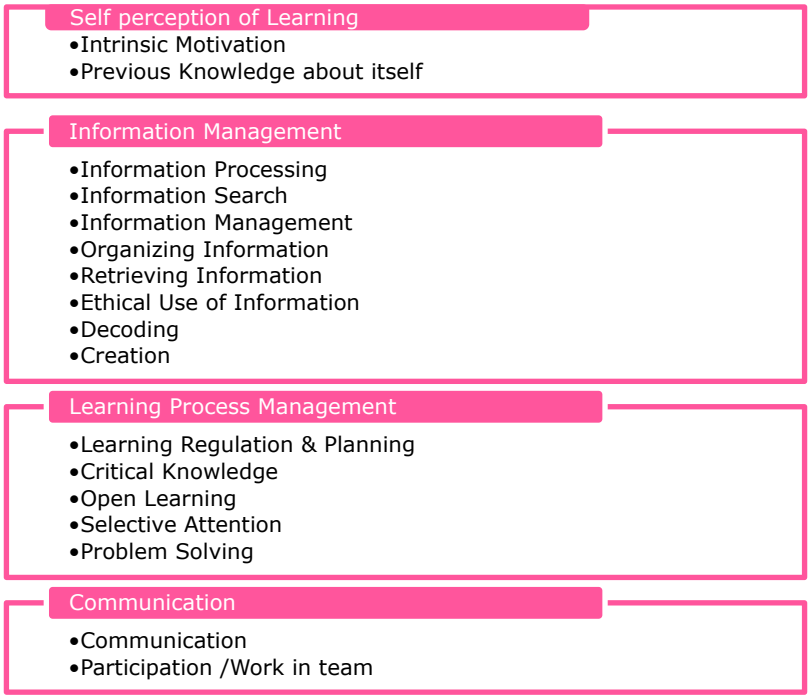

Figure 1. CAPPLE Project PLE Components (Author 1, Author 2, & Author 3, 2014)

The final survey - based on this model- comprises 48 questions (230 items). The structure of the questionnaire is:

- The first 4 items are demographic and general information questions.

- 8 of them are nominal questions, of which 2 have dichotomous categories.

- 35 questions are issues that reflect a scale of 5 levels plus an option "Do not use/not applicable", of which 30 correspond to frequency scales, and 5 to a level agreement scale.

After the questionnaire validation process, the research team realized that the survey was rather long. Nonetheless, the consideration of this study as an exploratory research and the need to collect data to enable interpretations which could try to conserve the complexity of the reality studied (Stake, 2010) acted as a justification for conserving the questionnaire as it stood.

According to the data on the survey desertion index, the first conclusion to be drawn related to the extent of the survey and its effect on participation (Krosnick, 1999). However, from the information the data shown, desertion is more complicated than just a question of size. We also

consider the difficulty of answering the questions because students were questioned about their internal learning mechanisms and were asked to evaluate themselves using scales. We think that these are some of the reasons to explain the high desertion (4399 people began the questionnaire but we only have 2054 people in the final sample (all of whom reached and answered the final page of the questionnaire).

II. Methodology of the Focus Group

As in any traditional focus group, each group was made up of 8-14 experts, from similar research interests, with similar expertise, but independent of each other. The objective was to create a bright - face to face- debate (Finch & Lewis, 2013), so the similarity and independence between experts were critical conditions. Finally, a total of 26 experts participated in the three groups, situated in three different locations.

The same facilitator was the moderator in the three focal groups following a common agenda. The audio from the sessions was recorded and a researcher from the project took notes in the three meetings. Once the debates were finished, the relevant aspects brought up by each group were triangulated to highlight the useful ideas.

The objectives of this analysis were:

- to underline the principal aspects and features related to learning that drew their attention, and that affect the study population.

- to identify potential emerging research topics that could be approached in future studies or, on the other hand, highlight issues that should be taken into account before any further in-depth analysis of the data

The main conclusions of these working groups are presented below.

III. Data and Results

a. Clear aspects to highlight

Based on the general analysis of the sample, some general aspects have appeared in the data which the researchers consensually highlighted in their focus groups. These aspects could be considered as striking trends that configure important aspects of the population and that transcend our study.

Analogical learners in digital times

Students (future professionals) seem to be much more analogical than digital in their preferences. Surprisingly, even when the context is increasingly digitalized, and many theories describe more and more young people with a "digitally enhanced life" (Prensky, 2001; White & Le Cornu, 2011; Goh, Bay, & Chen, 2015), students still prefer analogical formats for their work and learning activities.

As the data show, the majority of future professionals still feel more motivated to learn principally by lectures. In the question "*What situations increase my interest to learn about something*?", an

impressive 77.35% (almost 8 out of 10), declared that "*participating in a face.to face-lecture*" did , "*Always/Almost always or very frequently*" (Q5). This percentage is much higher than this option in the digital options in the same question (e.g., Podcast 42.56%, Facebook 43.62%, Twitter 26.06%, and so on).

Moreover, the majority of students use strategies related to work on paper much more than digital ones. For example, When students were questioned about what strategies and tools they use "to plan and organize my work and learning…" (Q11), as is reviewed in greater depth below (see 0), the only strategy with a majority agreement, is the paper based calendar for organizing their schedule. Also, when they "*find any interesting document on the internet*" (Q27), 60.47% of students prefer to read it on paper "*Always/Almost always or very frequently*". 46.79% of students (nearly half) state that they "*create drafts on paper*", "*Always/Almost always or very frequently*" before creating any new online information (Q 35). 38.70% (4 out of 10) state they take notes on paper about their reflections regarding their learning (Q36). Also, 59.40% say that when they "*find an interesting online video/audio"*, they "*watch/listen to this on the Web, and take notes on paper"*(Q28).

Finally, students are still much more comfortable with the idea of archiving their files "*in their computers as well as on the cloud*"; 92.5% affirm they do so "*Always/Almost always or very frequently*". In contrast, 51.7% of students say that they "*archive their files only in the cloud*", "*Few times or Rarely*".

New trends in the use of digital tools: Instant and Private Messaging is the king

According to the data from the survey, some changes are evident in the trends of use of online tools, among senior university students.

One of the main changes relates to the preference for using personal instant messaging,rather than forums, as is seen in the data shown in 0:

		Always/Almost always; Very frequently	Sometimes	Few times; rarely	Not use/Not applicable
Q5. *What situations increase my interest to learn about something*?	Forums	27.25%	24.99%	38.91%	8.85%
	Private messaging*	44.74%	18.34%	29.99%	6.93%
Q13. "When I want to learn something new, I go to."	Forums	24.68%	27.07%	41.33%	6.91%
	Private messaging*	36.61%	24.83%	32.62%	5.94%
Q46. "When I have a technical problem, I make use of…"	Forums	33.84%	27.90%	30.77%	7.50%
	Private messaging*	63.58%	20.84%	13.29%	2.29%
Q47. "When I have a question about the content or the work process, I make use of…"	Forums	23.52%	28.87%	38.90%	9.25%
	Private messaging*	62.61%	21.02%	13.44%	2.92%

*Including Facebook chat, Twitter's Direct Messages, Whatsapp or similar

Figure 2. Use of Forums Vs. Use of Instant or Private Messaging in Learning Activities in University Senior Students.

From the previous questions analysed, the difference between Forums and Private or Instant Messaging is not the only trend that is evident. In the four cases presented (Q5, Q13, Q46 and Q47), the importance of Instant and Private messaging is much more solid compared to other online tools.

In Q5: "*What situations increase my interest to learn about something***?"**apart from the importance of the more traditional options ("*face-to-face lectures*" and "*programs in traditional mass media"*) that take in the highest number of answers "*Always/Almost always or very frequently*". Close to half of the sample selected these responses in the options "*reading webpages or weblogs"*(52.50%), "*visiting online multimedia sites (as Youtube, Slideshare, Flickr, Prezzi, Instagram or similar)"* (50.66%) *and* "*chats in Whatsapp, Line or similar*" (44.74%); the other online options (Social Networking Sites, Online Mass media, and so on) present lower use.

Only in the case of Q13: "When I want to learn something new, I go to", is the situation a bit different. Students declare that they use "*Always/Almost always or very frequently*", the online options *"Blogs or Web pages"* (72.01%), *"Wikipedia or other online encyclopaedias"* (67.43%), *"online mass media"*(65.53%), *as well as "online tutorials (video, slideshows, etc.)"* (57.79%), i.e.,, more than the percentage related to "*contacting people by email or private messages in different platforms (Facebook, Direct Messages on Twitter, Whatsapp, or similar)*", which accounted ofr only 36.61% of the answers in the higher frequency. Nonetheless, this percentage is still above the percentage of "*Forums*" (24.68%), "*Social Networking Sites*" (21.52%) and "*Mobile Apps*" (13.83%).

However, in Q46: "When I have a technical problem, I make use of...", the option "*contacting people by email or private messages in different platforms (Facebook, Direct Messages on Twitter, Whatsapp, or similar)*" is preferred by students. 63.58% of the respondents marked "*Always/Almost always or very frequently*", more than any other option, online or face-to-face.

Similarly, in Q47:"*When I have a question about the content or the work process, I make use of…",* 62.61% of answers for the option "*contacting people by email or private messages in different platforms (Facebook, Direct Messages on Twitter, Whatsapp, or similar)*" were answered "*Always/Almost always or very frequently*". This was surpassed only by the option "*Colleagues and friends contacted face to face"* (73.22%). The use of other online tools appeared much lower.

Also, 41.19% of the students declare that they prefer Instant Messaging (Whatsapp, Line, Skype, and so on), "*to foster collaboration and interaction with others*" (Q39). This is far from other tools like email (27.65%), Social Networking Sites (25.85%), Videoconferencing (3.07%) or Chat (2.24%).

Future professionals are not actively organizing their learning

According to the data, future professionals appear as people without many strategies, or tools (face-to-face and online), for organizing their work and their learning.

First, when students were questioned about "What are your main reasons for accessing the Internet*?"* (Q7), only half (47.69%) marked "*Totally Agree or Agree*" for the option "*Organization*". This percentage is the lowest (with more than 30% difference) compared with the other options

presented - *"information"* (98.29%), *"communication"* (91.03%), *"Leisure"* (87.92%), *Work* (81.76%), *"Training"* (82.65%), and *"Social Relationships"* (79.90%).

Then, students were actively questioned about what strategies they use to manage and organize their work and learning (Q11). As is evident in 0, apart from the organization of their time in a calendar, done by 62.46% of them "*Always/Almost always or very frequently*", they do not seem to use any other strategy, or tool, frequently.

	Always; Very frequently	Sometimes	Few times, rarely	Not use/Not applicable
I organize my ideas andtasks, in an online task manager (e.g., Evernote, Remember the milk ...)	8.28%	6.62%	32.91%	52.19%
I organize my time using a calendar (on paper)	62.46%	12.17%	17.67%	7.69%
I organize my time using an online calendar	18.11%	11.39%	35.93%	34.57%
I use a tool to organize my online resources and tools, like Symbaloo, Netvibes...	3.55%	3.21%	30.92%	62.32%
I use a tool to organize my time (time management tool, e.g., Pomodoro)	2.19%	2.04%	29.36%	66.41%

Figure 3. Q11: "to plan and organize my work and learning…"

Additionally, they affirm they organize their information (Q25) in folders hierarchically, but they do not use any other strategy, or tool regularly to organize information. Furthermore, almost half state that they never use Wikis (49.22%), Blogs (45.67%) or Social Bookmarking (52.87%) for this. Moreover, a high percentage of students state that they use *"Few times; Rarely, or never"* for organization tools like Time Lines (57.79%), Social Software (like Twitter or Facebook) (77.46%), Blogs (87.24%), Social Bookmarking (90.12%), Wikis (90.21%).

	Always; Very frequently	Sometimes	Few times, rarely	Not use/Not applicable
Organize my information in folders (Hierarchically)	94.69%	3.51%	1.61%	0.19%
Organize my information in a Timeline	22.59%	19.62%	44.60%	13.19%
Use Social Bookmarking tools (Diigo, Delicious...)	4.14%	5.74%	37.24%	52.87%
Use wikis	3.70%	6.09%	40.99%	49.22%
Use blogs	4.48%	8.28%	41.58%	45.67%
Use Social Software (Twitter, Facebook...)	10.71%	11.83%	48.34%	29.11%

Figure 4. Q 25: "to organize and manage the information, I prefer to…"

Some more data suggest that this deficit in the learning organization could be extendable to the rest of the self-regulation strategies of future professionals. Nevertheless, this is an entire category of the CAPPLE model that must be analysed in conjunction with all the related data if broader conclusions are to be drawn.

Students are critical of information but not critical at all of the information from experts and teachers

Something that has been reported in other studies is the high trust students place in their teachers, as information providers (Carter, Stephenson, & Hopper, 2015; Castañeda & Adell, 2014; Coll, Engel, Saz, & Bustos, 2014; Ignatova, Dagienė, & Kubilinskienė, 2015, among others). This confidence is extended to experts. The data from this survey, confirm this perception.

In Q19, just a minority of students affirm that they "*question the information received from…"* their *teachers* (19.67%), or *experts* (13.19%), "*always/Almost always or very frequently*". They have more qualms with information received from *tutorials* (33.74%) or mobile applications (34.96%). Nevertheless, the majority of them are critical of information from *friends & family* (45.76%)*, email news* (53.07%)*, traditional mass media* (57.59%)*, Twitter* (57.16%)*, Blogs and Webpages* (61.25%)*, Forums* (61.64%)*, online mass media* (62.46%) *as well as Social Networking Sites* (72.10%)*.*

In the question "*What increase the credibility of a piece of information*" (Q20), the high trust in experts is confirmed. The answers show that there are only two criteria that increase the credibility of information "a*lways/almost always or very frequently*" for the majority of students: if the information is *recommended by an expert* (89.78%), and if the information *appears repeated in various resources* (79.65%).

In general, when students answer about their perceptions about the information they receive (Q21), 55.01% of pupils think "a*lways/almost always or very frequently*", that this information "*is not always true or does not always correspond to reality*". In the same way, the 67.53% of students assert that they do "*Contrast the information",* "a*lways/almost always or very frequently*". If to these results we add in both cases the alternative "*sometimes*", the percentages are very similar: 92.36% and 91.97%, respectively. Nonetheless, it is worrisome that 10.95% of students affirm that "a*lways/almost always or very frequently*", they "*should not question it* –information-*, whatever its origin"*.

Blurred conclusions about some learning aspects to keep track of

Some data suggest that students in the last year of university do not have global strategies for learning. The data suggest that they use particular tools, depending on the moment, but that do not respond to a thought strategy around learning. Students know how to use some tools, but do not integrate those tools into effective processes. Additionally, it seems that they do not integrate learning activities with each other. From the data, one senses an enormous lack of reflection; students do many things but do not connect those activities, and in the end, learning activities appear as isolated, with no particular proposal (goal, project, and so on) that integrates them all.

The data indicate as well an evident division between different roles that people assume and the tools they use (Personal Vs. Professional, Work Vs. Leisure, Formal Vs. Informal learning, and so on). Nonetheless, even though they appreciate the importance of their professional role, they do not seem to be aware of repercussions of their activities in different online tools.

Finally, the data suggest that students in the last year of their degree course have their future working life in mind, but they are still students; they are not workers yet. Therefore, they react to the proposals -or requirements- made by teachers, course-mates, the educational institution or the formal learning system; so, they are still not a wholly proactive agent in their learning process.

b. Potential emerging research topics

In second place in the analyses made by the three focus groups were some topics that were not clearly defined by the data available, but some of these will be part of a specific analysis in the same project, while, unfortunately, others would be part of future initiatives.

After the discussion-based analyses in the focus groups, some topics emerged as relevant for immediate analysis, which will be done in the context of the CAPPLE project, and others that should be addressed in future studies:

The CAPPLE Project is an exploratory piece of research based on a self-report survey. The next steps in understanding PLE must include the study of students' learning in context, including the direct observation of learning processes, as well as a collection of evidence of the development of these processes; not only self-reports.

Additionally, it is vital to continue research on university teaching, trying to connect the study of learning tasks (types of tasks that are included in university courses), and ways to boost the development of basic strategies for the PLE development (search, organization, self-regulation, and so on).

This includes highlighting self-regulation - and self-direction in the case of adults- as a key competence, understanding that self-directed learners could be naturally empowered to support, develop and manage their PLEs (Dabbagh & Kitsantas, 2012; Yen, Tu, Sujo-Montes, Armfield & Chan, 2013).

Likewise, it has emerged that a study of the relationship between data, like those studied in CAPPLE, and specific psychological characteristics of students, as well as teachers, is a matter of increasing interest.

Some data from the survey suggest a close relationship between cultural capital (as in DiMaggio, 1982) and the way people generate and manage their PLEs. A deep study to explain better the influences of social conditions and learning, as well as the development of PLE would be recommendable.

It seems increasingly important to understand the PLEs of professionals, understood as people currently working in different job positions as well as unemployed.

Similarly, there is a clear need to analyse the different contexts (formal, non-formal, personal, social, and so on) and their influence on PLE development, as well as how those contexts could converge in broader and more global, personal learning proposals. Moreover, and in line with previous works (Castañeda & Camacho, 2012 or Bartsch & Dienlin, 2016), it is important to study

in depth the impact of the different actions of the various learning contexts on the (digital) identity of the person.

Following the data, the role of beliefs about learning in the way people carry out their learning processes seems imperative. Therefore, it is crucial to propose dynamic changes in the traditional beliefs about learning (What is learning? What is learning for? How to teach? What is important to teach? and so on). These proposals could underlie current teaching and learning at any level, as well as changing the perspective of seeing learning as a formal process that only takes place in formal institutions, and not as a personal challenge for every person and which must be a key part of life.

IV. Further Steps in the Project

After this first joint general overview, it is time to analyse in depth the data we have recovered from the sample, in the light of the model that we have created to better understand the concept of PLE and its reality

Even though the final sample of complete questionnaires is 2054, taking into account the kind of sampling used in the study, it is not possible to speak properly about the representativeness of the sample. Nevertheless, the number of complete answers is extraordinary and would give us an excellent overview of the population for in-depth study in future research.

After the first approach to descriptive data that we explain in this article, we are going to analyse data from different perspectives in order to understand the picture of the PLE that our data show us. We are interested in the study of gender differences between our students also in studying the differences between areas of knowledge (science, health, humanities, law, arts, social sciences and engineering).

In another sense, we will analyse the different elements that we had already understood as the basics of the underlying model for every PLE (the CAPPLE model explained in 0). Apart from seeing how students' answers represent every part of the model, in general, it is interesting to see how those elements appear to be more related to the independent work of the learner. Also of interest is how they are related to formal educational mechanisms dependent on others (academic staff, universities, conferences, compulsory assignments, and so on.)

Moreover, one of the emergent topics in this analysis process is one of the principal research lines that the group is developing: PLE patterns and associated profiles. This topic was originally included as a small part of one of the objectives of the project, but the analysis has revealed it as being crucial regarding better understanding of the PLE structure, origin and dynamics, as well as in beginning to infer how the formal educational processes would influence them.

In addition to this, during the project we have developed a tool for diagramming the results of the survey. The main goals of this development were, on the one hand, to explore other ways of understanding the data and the PLEs and, on the other, to present the data in a more "readable" format for normal users. Currently, we continue to work on the possibility of creating an easy read interface for those that have collaborated with the survey of the project to provide them with some useful information about their learning and their options for improving it.

V. Far from conclusions, still far away from learning

The results presented in this paper are still very limited but they do try to show some different perspectives from the data collected, based on the interpretation of the processes made before the in-depth analysis.

From the data, it seems that formal education processes – at least at university- are not preparing professionals to be independent learners, near critical, as would be desirable, to cover the current society needs. Our students are nearer to a "traditional model" of student than to an innovative student, as we have shown above. In this sense our results show a university student really different from the model of student explained by Prensky (2001) (see Prendes, Castañeda, Gutierrez & Sánchez, 2015).

However, the processes that constitute the learning -and consequently configure the PLE- cannot be explained easily, and could converge in many different ways, through complex processes. Understanding this is still a long research journey away, and models that help us to improve are still elusive.

Some of the result, challenge researchers to not resort to oversimplifications that detract from learning, and become mere mini processes capable of being falsely automated. By contrast, the commitment as researchers is to provide in-depth studies that can help learners and educators to understand better what we can do to enhance the learning experience of future professionals.

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