Using SymbalooEDU as a PLE Organizer in Higher Education

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Abstract. This paper presents a case study related to the use of personal learning environments (PLE) in higher education. In this study, SymbalooEDU, a self-management tool was used. This tool allows students and teachers to organize their bookmarks, RSS and widgets in a visual way, using tabs and blocks with colours and different space distribution. Although it can be used for different purposes, its use as a PLE organizer seems to be interesting. This study aims to find out whether personal learning environments powered by institutions are meaningful and useful for students and lecturers to learn; what students do with this tool at a personal and academic level and what type of elements they include; and whether this kind of tools facilitate merging formal and informal learning. The data were gathered through questionnaires, interviews and observation, and results and conclusions are drawn up from these data.

Keywords: PLE, organization tools, higher education, Web 2.0, Formal and Informal Learning

1 Introduction

Recently, some research and empirical studies have been conducted on Personal Learning Environments (PLEs), and although many authors have been trying to define the PLE concept (Buchem, Attwell, & Torres-Kompen, 2011), there is still no agreement on it. However, PLEs are here to stay (Sclater, 2008), since personal learning is gaining greater importance in education. Moreover, real educational contexts need more empirical studies in order to include these environments and to take into account students' needs and preferences in their learning.

Considering these aspects, our paper aims to contribute to the field of empirical studies on PLEs in higher education. Its importance resides in the necessity to find strategies to integrate VLEs and PLEs, so that the gap between formal and informal learning can be overcome.

From our point of view, PLEs foster and facilitate the type of learning's perspective that education has been searching for some time: the user-centred learning approach.

This study is derived from project EDU2008 05345 'Designing Methodological Strategies for the Use of Shared Knowledge Spaces through Software Tools and Knowledge Management Systems in Virtual Learning Environments'. From a technological perspective, the aim is to overcome the rigidity of VLEs by integrating other environments and, from a pedagogical perspective, to use student-centred educational strategies.

2 Reference Framework

PLEs are considered from different perspectives (Fiedler & Valjataga, 2010). With this study we consider both technological and pedagogical points of view. On the one hand, we use SymbalooEDU as a tool to collect other services and tools. On the other hand, the introduction of this tool is done with the purpose of being useful for students and lecturers to construct their own PLE.

2.1 Background

The background of this study is based on some of the following issues:

- The potential offered by Web 2.0 tools. Their possibilities are multiple due to their characteristics (Castaño & Maiz, 2007): 1. The activity is focused on the web, 2. Any user can participate by publishing and sharing content in the web and 3. The published content is easily localizable and referenced;
- The importance of learning centred on the students, and not on the institution (Olivier & Liber, 2001) or the teacher (Salinas, 2009). This is related with the attitude of the *prosumer,* which describes the situation when information consumers are also producers of new information (Schaffert & Hilzensauer, 2008). Students have the possibility of participating actively in decision-making concerning their learning;
- The need for life-long learning (Attwell, 2007; Olivier & Liber, 2001). This necessity leads to giving importance to informal learning (Attwell, 2007), the integration of informal and formal contexts, and reflection on one's own learning process (Dabbagh & Kitsantas, 2012). For this reflection, students must develop and apply self-regulated learning skills. According to Cross (2009), we understand that 'learning is formal when someone other than the learner sets the curriculum' while 'informal learners usually set their own learning objectives'. We have to bear in mind that PLEs are built bottom-up starting with personal goals (Dabbagh & Kitsantas, 2012);
- Restrictions presented by VLEs. Some of these are the lack of openness and integration with informal services, resistance to change, or failure to take into account the user (García-Peñalvo, Conde, Alier, & Casany, 2011). This is consistent with what Liber (2005:10) stated, 'there is a mismatch between what people are doing on the Internet, and what leading learning environments are providing'.

Starting from these elements, we consider that PLEs are more suitable environments for learning than VLEs. According to Chatti, Agustiawan, Jarke and Specht (2010), PLE characteristics are: the possibility of personalization, support for informal learning and lifelong learning, openness and decentralization, bottom-up approach – attending learners' needs -, knowledge-pull and ecological learning. As can be seen, they tackle some of the most important restrictions presented by VLEs.

We can find a lot of definitions for PLEs in the last five-six years as can be seen in Buchem et al. (2011). Like other authors (Attwell, 2007; Castañeda & Adell, 2010), we consider that a PLE as the collection of tools, services and devices that we use in our everyday life for learning, in any context – formal and/or informal. The tools included in PLEs are aimed at facilitating three cognitive processes (Attwell, 2007): reading, reflecting and sharing. Therefore, we are talking about three types of tools with different functions (Wheeler, 2009): accessing information, creating and editing information, and interacting with other people.

2.2 Relevant Experiences

In the last few years, some studies in the field of PLEs in higher education have been carried out in Spain and abroad.

Some of them are worth noting due to their interest for our case study:

- Design and development of postgraduate student PLEs based on Google Apps (Marín & De Benito, 2011). University of the Balearic Islands;
- Integration of Moodle (VLE) and Mahara (e-Portfolio) for working on projects with undergraduate students (Salinas, Marín, & Escandell, 2011). University of the Balearic Islands;
- Development of undergraduate student PLEs using different web 2.0 services (Santamaría, 2010). University of León;
- Implementation of a preconfigured PLE based on Google Apps in order to merge institutional and personal services, allowing social networks to be generated and maintained (Casquero, Portillo, Ovelar, Romo, & Benito, 2008; Benito, Casquero, Tejedor, Ovelar, & Portillo, 2007). University of the Basque Country;
- Implementation of a virtual campus where Moodle, personal services and social networks are presented - SAPO Campus (Santos, Pedro, Ramos, & Moreira, 2011; Santos & Pedro, 2010). University of Aveiro, Portugal;
- Implementation of a PLE based on a mash-up of widgets connecting different web applications (Taraghi, Ebner, & Schaffert, 2009). Graz University of Technology, Austria.

3 The Case Study

3.1 Background Context to the Activity

The study was conducted in two courses of Educational Technology in the studies of

Pedagogy at the University of the Balearic Islands, held between 26th September 2011 and 25th January 2012. Both courses used the blended modality, with face-to- face lectures complemented by virtual support and tasks. One of the courses is entitled 'Distance and Flexible Education' in the fourth year of the degree and the other one is 'Development of Didactic Materials' in the third year of the degree.

In both courses, the SymbalooEDU tool was presented in one of the first face-to- face lectures as a workshop on the tool. In this seminar, we explained to students how to use this tool to organize their own PLEs. Use of the tool was not included in the course assessment, so its use was optional. The intention with this session was to encourage students to become aware of their learning process by reflecting on the tools they usually used, the webpages they usually visited, the services they accessed, and so on.

On the other hand, one of the course lecturers was aware of the existence of this tool. Actually, he was already using it to organize his PLE in sections: research, teaching, personal tools, etc. Before the workshop, the use of SymbalooEDU was described to the other lecturer, who was enthusiastic about its usefulness and used it for different purposes. One of these purposes was to collect the reference links of her course so as to facilitate her students' access to them. This was a resource page for her students embedded in the course in the institutional VLE as can be seen in Figure 1.

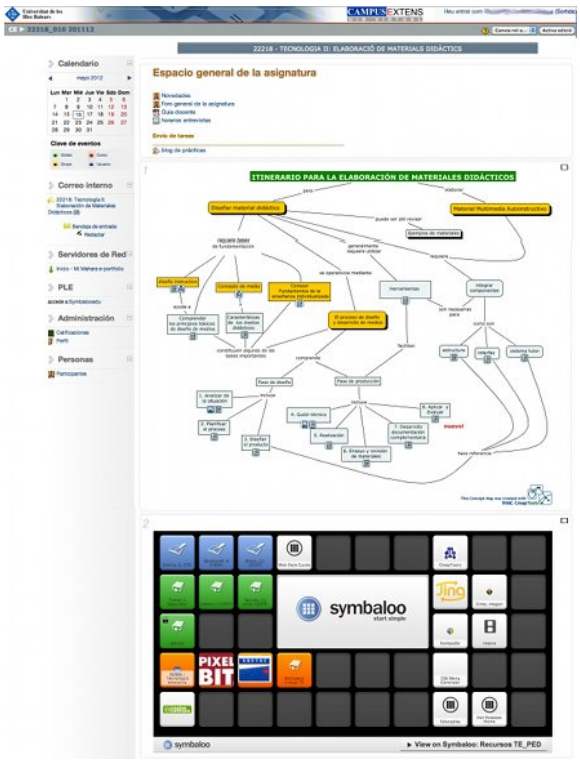

Fig. 1. Screenshot of the course 'Development of Didactic Materials" on the institutional VLE

The methodology of the courses was based on projects. In the case of 'Distance and Flexible Education', in groups, students had to design a prototype for a course in a virtual environment, an IT strategy or a virtual community. In 'Development of Didactic Materials', students had to elaborate multimedia material in groups.

3.2 Questions Posed

With this case study we wanted to find out some issues related to PLEs in education:

- What tools can foster the construction of a PLE in higher education?
- Do students and lecturers consider building their own PLE at university useful?
- What is the user experience with this kind of environment?
- Can an environment designed initially from an academic context go beyond and be used as one's own PLE?
- What kind of tools form part of a student's or lecturer's PLE?

3.3 Methodology

For this study, an intentional sample of 73 students – between both courses – and their two lecturers was used. Most of these students were women under 24 years of age, with full-time dedication and unemployed. Concerning previous familiarity with technologies and web tools, this is supposed to be medium-to-high since students had to pass a/some course/s related to educational technology before attending these ones.

For this case study, we selected a web service rather than a software tool. To differentiate these types of services, we adhered to the classification of Castañeda (2010). Although this typology is used for social networks, we understand it as a broader classification where Web 2.0 tools could be framed. The advantages of using web services with regard to a software tool are ease of use, availability on the web, universality of use - there is no need for installation – and the fact that it is free for personal use.

SymbalooEDU is this web service. It allows the customization and configuration of one's own homepage - called webmix - by building it with visual blocks to access preferred services and bookmarks. It can be used to create one's own PLE but it is also interesting, for instance, as a student or teacher's tool or repository for a course[1].

To obtain information regarding these issues we established three data-gathering procedures:

- Student questionnaires in two stages. Their objective was to collect data related to the students' experience with this prototype of PLE. For example, items such as usefulness for learning, personalization possibilities or ease of use were taken into account;
- Observation of the screenshots of the students' environments. For this, students were

[1] Some other uses of SymbalooEDU in education can be seen at: http://www.symbalooedu.com/tag/educator-spotlight/

asked to send us a screenshot of their PLEs in SymbalooEDU through the questionnaires;
- Interviews with the course lecturers and with some students. This procedure was applied so as to triangulate data and to represent graphically what learning processes were performed and what tools were used to do them.

3.4 Study Phases

The study was conducted in three phases, as shown below:

- First phase: Design of a preconfigured environment with SymbalooEDU. This contained basic institutional services and some generic ones. The lecturer who was unaware of this tool learned about it;
- Second phase: Workshop for students on the use of SymbalooEDU. The previously designed environment was shared with the students in the workshop. During this session, students were encouraged to use the tool to organize their own PLE by modifying the initial elements. Use of the tool was not included in the course assessment, so its use was optional and voluntary;
- Third phase: Appraisal of the experience by students and lecturers. Data collection was conducted through student questionnaires, observation of student PLEs and interviews with lecturers and some students.

First Phase. As previously stated, a preconfigured environment was designed to integrate institutional services as well as some generic tools. The institutional services were links to the university webpage and intranet, and the institutional VLE. The generic services were widgets for showing the weather and the time, performing a search on the web, looking up words in the dictionary, translating words into another language, creating a task list, and making notes.

The preconfigured environment can be viewed in the following screenshot:

Fig. 2. Screenshot of the environment designed on SymbalooEDU

Second Phase. The workshop on SymbalooEDU was conducted with each group of students in the two courses.

In these workshops, the facilitator and lecturers gave a brief explanation about what the PLE was and how to configure it in SymbalooEDU, as well as about the usefulness of doing so. In the sessions, students were encouraged to create an account in the service and then to copy the preconfigured environment. After that, the idea was that they would adapt it to suit their educational needs. Additional face-to-face and web support was also provided.

Third Phase. In order to collect information about the students' initial experience in SymbalooEDU and their first impressions, an initial questionnaire to fill in via web was designed.

After a month and a half, a second questionnaire was implemented to learn about the evolution in the use of this environment and students' opinion based on such use. The design of this second questionnaire was improved by taking into account the first results.

In addition, interviews with the course lecturers as well as some students were conducted. The latter were selected by their attendance frequency to class and the use of the tool as a PLE. In these interviews information about PLE use and the tools students and lecturers usually used were collected and represented in maps.

4 Research Results

As the three data-gathering procedures aimed to collect data concerning the same items, we divided this chapter into different sections according to the issues on which we extracted information.

Between the first and the second questionnaire, students were asked to answer some questions related to the following issues:

a) Usefulness of the environment (both questionnaires);
b) Ease of use (both questionnaires);
c) Customization and adaptation to the preconfigured environment (both questionnaires);
d) Use of the SymbalooEDU tool (only second questionnaire);
e) Use of other tools different from SymbalooEDU (only second questionnaire);
f) Overall assessment of the pilot study and the suitability of the tool (only second questionnaire).

In a), b), c) and f) students had to indicate their degree of agreement or disagreement with several statements on a scale of 1 to 5, with 1 being strongly disagree and 5 strongly agree.

In the first questionnaire, out of the total of 105 students, 66 answered it. Out of these 66, 31 were non-completers and 35 completed it. In the second questionnaire, out of the total of 102 students that did not refuse to participate further in the first round, 29 completed it and 11 did not. Therefore, we had 40 questionnaires answered in this second round. When we indicate that there are partial answers we are referring to students that

began to fill in the questionnaire but gave up when they had to send the screenshot of their environment. Although the same people were invited to participate in the two questionnaires, not exactly all of them were involved in both: some did participate in both – 27- but others participated for the first time in the second questionnaire -13- and others, who had participated in the first, did not participate in the second - 33.

Most of the students - 73% in the first questionnaire and 80% in the second one - who filled in the questionnaires were enrolled in the course 'Distance and Flexible Education'. This seems logical, since most participants were on that course.

Students were also asked to provide screenshots of the PLEs in the questionnaires in order to analyse the new content included. A total of 48 screenshots sent between the first and second questionnaires were taken into consideration. To process the information provided by these screenshots on both questionnaires, we conducted a content analysis. New blocks and their typology, environment customization and degree of adaptation to the preconfigured environment were considered.

Last but not least, interviews with some students and the two lecturers were also conducted. In the interviews, information was sought regarding the main objective to obtain more information about the components of the PLE of students and lecturers. After the interviews, maps were designed to represent the types of elements included in the PLEs graphically – similarly to what was done in de Benito, Lizana, and Salinas (2011). This representation was according to the classification of tools proposed in Wheeler (2009).

4.1 Usefulness of the Environment

Concerning the tool's usefulness for one's own learning, about 60% of students agreed or strongly agreed - ratings 4 and 5 - in both questionnaires. It is noteworthy that no-one was in total disagreement and 30% neither agreed nor disagreed -first questionnaire. The latter percentage dropped to 13% in the second questionnaire.

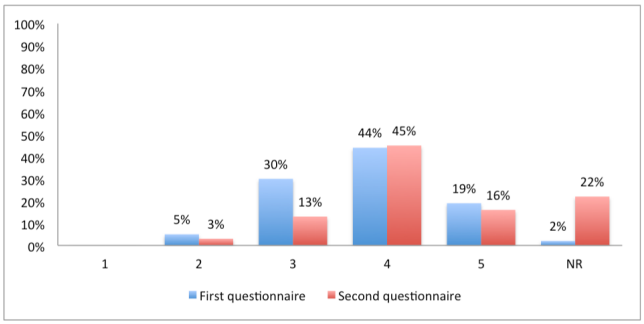

Fig. 3. SymbalooEDU seems a useful tool for my learning.

Regarding the tool's usefulness to construct the PLE, students had to assess several statements related to learning inside and outside the university.

As the results on the four statements show, students considered SymbalooEDU a

useful tool to manage personal learning in the course, at university, in all areas of their lives and throughout their life. However, it is remarkable how the students assessed the usefulness of SymbalooEDU to manage their personal learning at university in the second questionnaire - 87% - and undecided students fell to 17% with respect to the first one. Apparently, students thought of this tool as an academic one, since positive assessment was lower the larger the field of application of the learning management.

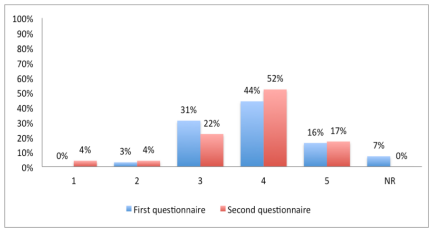

Fig. 4. I think this tool is useful to manage my personal learning on the course

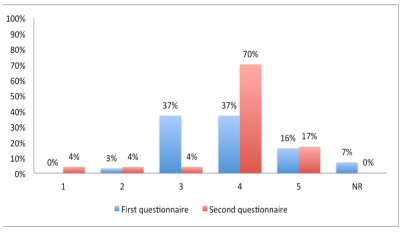

Fig. 5. I think this tool is useful to manage my personal learning at university

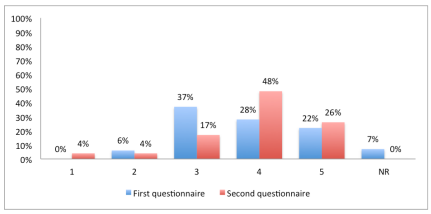

Fig. 6. I think this tool is useful to manage my personal learning in all the areas of my life

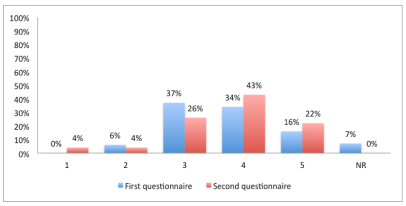

Fig. 7. I think this tool is useful to manage my personal learning throughout my life

Concerning lecturers' perceptions regarding the tool's usefulness, they valued it quite positively in the interviews. The lecturer of 'Development of Didactic Materials' remarked that SymbalooEDU, though useful, is still only a tool for adding bookmarks and homepage. However, she highlighted that what may be interesting as a learning tool is the possibility of adding annotations to value the new resources added to the webmix. On the other hand, the lecturer of 'Flexible and Distance Education' thought that SymbalooEDU is a really good tool for learning but especially for organizing yourself and having everything that you use at hand. What he remarked as the most notable limitation for learning is its inability to collaborate and work with another person in a webmix – nowadays the tool only allows unidirectional sharing.

4.2 Ease of Use

As far as ease of use is concerned, there seems to be no doubt in the first questionnaire, since the assessment is quite positive - 82% agreed with the statement. In the second survey this percentage dropped to 62%, presumably due to the increase in the proportion

of no response.

In relation to whether it was easy to become disoriented in the options offered by the tool, over half students in both questionnaires considered the guidance tool was appropriate. Despite this, 20% of students thought that orientation through the service was difficult.

4.3 Customization and Adaptation to the Preconfigured Environment

Neither does there seem to be doubts as to whether the tool allowed many possibilities for customization and configuration: 85% of students agreed. The second questionnaire also lowers the percentage, for the same reason discussed above, down to 62%. Also noteworthy is the reduction of lack of positioning - rating 3-, reduced from 30% to 10% from a questionnaire to another.

Moreover, the majority of students - 68% - believed that SymbalooEDU provides many blocks, links or widgets that interest them. In the case of the second questionnaire, the percentage drops to approximately the half of agreement.

In relation to the degree of adaptation to the preconfigured environment, many participants that used the tool indicated that they did not introduce meaningful changes in the initial environment. In fact, most of them did not personalize their PLE with their name but kept the default name of the preconfigured one. Concerning the customization of the PLE wallpaper, most of them changed the background for one from the collection of SymbalooEDU. Only a few of them changed it for a personal image.

Despite this little customization, most students reported in the questionnaires that they added new blocks in their environment. These new blocks were dedicated mainly to: entertainment, keeping up on social networks, performing academic searches, following specific personal interests, editing content on blogs, staying informed, asking questions and banking. This is consistent with what it is observed in the screenshots of the PLEs. In fact, the new blocks were, in order of frequency, related to leisure (especially fun websites like *Visto en Facebook, Cuánta razón, ...*), those related to social networks - especially Facebook and Windows Live – and Web 2.0 tools and services based on audiovisual media both with and without social characteristics - especially Youtube, and watching series on the internet, the latter included in the leisure section.

As far as tools requiring download and installation were concerned, few blocks were observed in the screenshots of the PLEs. This is not surprising since SymbalooEDU is a web service and it would not make much sense to incorporate tools that cannot run if not in desktop version. It can also happen that, even if the tools have a web version, students may only use the desktop version, and in this case it would not be incorporated into their PLE in SymbalooEDU.

To differentiate between learning contexts – personal, academic or professional –, students and lecturers performed some organization techniques in the webmix. In the interviews, they pointed out different strategies: assignment of colours to the blocks according to the type of link or function, the placement of the blocks in the same webmix or the creation of new webmixes dedicated to something.

On the other hand, most students did not create new webmixes different from the preconfigured environment. When they did, three scenarios were possible: 1. The new

webmix was the page of resources copied from the course of 'Development of Didactic Materials' - for its students -, 2. The students created a new one with their name or writing 'my webmix/Webmix', copying institutional services from the preconfigured webmix and adding some more blocks of frequent use, and 3. in some specific cases, students created new webmixes to devote to different areas of their interest, e.g. shopping, leisure, training...

As for the widgets included in the preconfigured environment, they were rarely used. Most students left them as they were at first, some students removed all of them, and very few students added something new, like the Google search engine - although the generic search engine was already included -, the horoscope, Wikipedia or agenda. When students were asked in the interview about the use of these widgets in their PLE, most of them said they hardly used them. They said that they kept them in their environment in case they needed them one day or so as not to have such an empty webmix.

4.4 Use of the SymbalooEDU Tool

One question that was only in the second questionnaire was whether students used SymbalooEDU after the workshop. More than half students – in blue - indicated that they had, which is interesting to know.

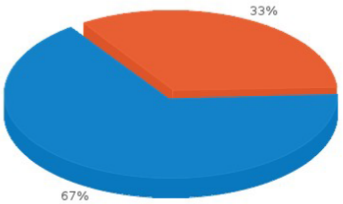

Fig. 8. Using SymbalooEDU tool for the design of PLEs

Among the reasons for not using the tool, the most featured were not under- standing and not considering it useful for the construction of their own PLE.

Some comments in this regard are the following:

'I do not quite know how to handle it, but I will try.' 'I do not usually use these tools; I only use them in the course.' 'I learned to organize my work without this tool, and more effort will be required to handle it than continuing as up to now.'

Related with the latter comment, students were also asked about the time spent configuring their PLEs. Only a few of them configured their PLE exclusively during the workshop. For almost half of students, this task took them several days during the weeks following the workshop while a quarter of students did it during the time between the first and second questionnaire.

4.5 Use of Other Tools Different from SymbalooEDU

After obtaining the results of both questionnaires, we interviewed some students from both courses and their lecturers. Interviews confirmed what was observed in the screenshots and reaffirmed the conclusions drawn so far. In addition, we obtained information concerning the use they gave to their PLE elements.

In this section we have included some relevant maps of the PLE interviewees. To understand the symbols used on the maps, the caption is incorporated:

- Colour: Academic applications or services are in yellow. Personal and academic use of services is in green. Personal use is in orange;
- Forms: A rectangle for applications with an installed version - in some cases it is the only possibility to use the tool - and a circle for web services.

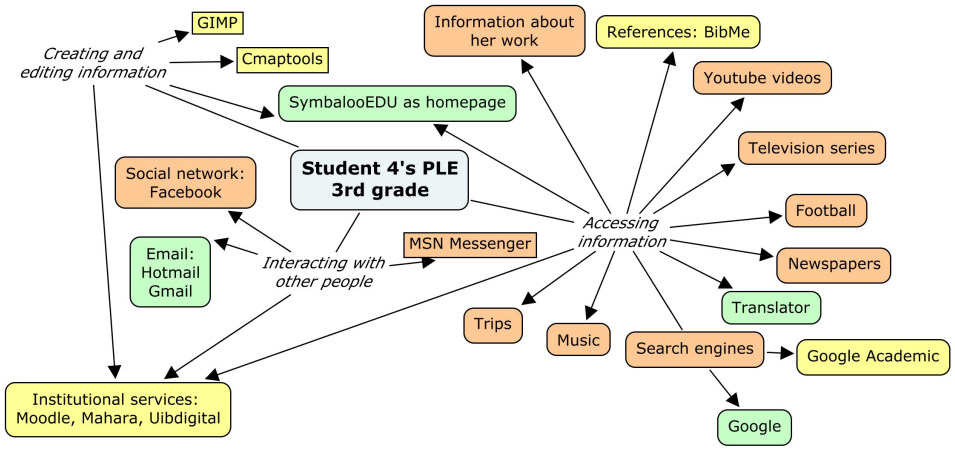

Fig. 9. PLE map of a student

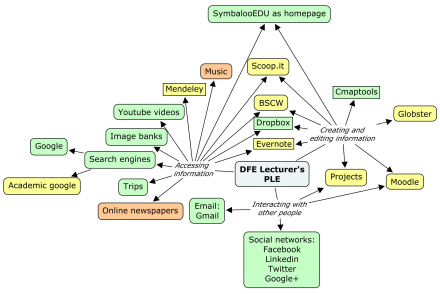

Fig. 10. PLE map of the 'Development of Didactic Materials' lecturer

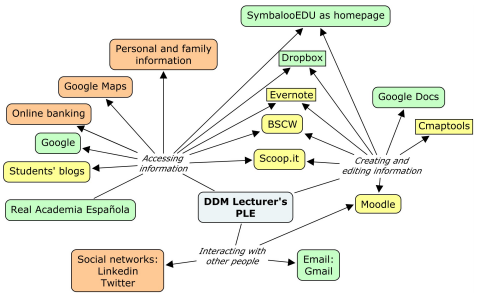

Fig. 11. PLE map of the 'Distance and Flexible. Education' lecturer

Related to the tools that interviewees included in their PLE, it is worth noting that one of the students stressed not only the personal but also academic use of the social network

Facebook. She was using Facebook for collaborating and sharing with classmates in a group page. This may be interesting to bear in mind when incorporating social networks into a PLE and emphasizes the potential of social networks for education. The use of tools and applications in an academic context can end up affecting the students' PLE. This environment sometimes integrates them, but not always with the same functionality and context as at first. This can be observed in the maps of most students interviewed from 'Distance and Flexible Education'. The same applies for some of the students interviewed from 'Development of Didactic Materials'.

One of the questions students were requested to answer was what other tools they usually used that were not included in the SymbalooEDU environment. Some applications, most of them installable, were identified. We can recall, for instance CmapTools or Gimp. Moreover, many students used these tools on other courses, but in the same context – academic. It is worth remembering that it was usually in this context that they started to use them.

4.6 Overall Assessment

Finally, students had to assess the suitability of SymbalooEDU for designing the PLE on a scale of 1 to 10. 1 stood for the lowest score and 10 for the highest one. This adequacy was punctuated quite positively: 97% above the value of 6.

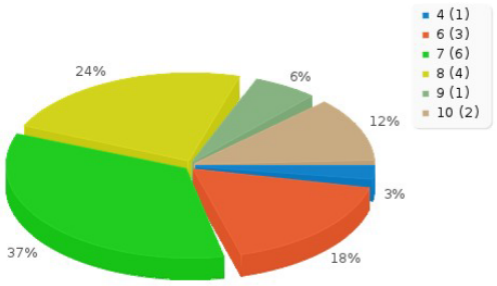

Fig. 12. Assessment of the suitability of the tool for designing the PLE

Some students included reflections and comments in the observations box of the questionnaires. We include some of the most meaningful:

- 'It is very useful software, but for the time being it seems difficult. However, I think it is like everything: difficult until I get used to it.'
- 'I find it very useful day by day, as it lets you organize websites that you use by the different blocks, which also have the possibility to be edited with an image and so on, which makes it more interesting.'
- 'I am a person who likes to have everything very organized and this software allows me to have all my programs organized in one place and have easy access to them.'
- 'I think Symbaloo is a very useful tool. It helps us to organize ourselves and allows

us to access the websites we frequent quickly. I think that, now and in future, it will be very useful. Therefore I think it is a good working and learning tool.'

- 'As I need or discover new tools, I incorporate them to Symbalooedu.'
- 'Symbaloo is a tool that, perhaps by learning to use it in the first academic year, we would get more out of it. From different courses lecturers would invite us to use it and exploit it to the maximum, thus in the non-academic future we would use it for self-learning. Now, at the end of the studies, everyone will use it until tasks and exams, and then only 10% of students will continue using it.'

5 Conclusions

SymbalooEDU seems to be an interesting tool for fostering the building of a PLE, especially due to its ease of use and its customization possibilities. It is also considered useful for learning by both students and lecturers alike, despite its flaws.

The results drawn from the questionnaire show that most students used the tool only for academic purposes. Presumably due to this, they did introduce some little changes – background, new blocks and change of name - in the preconfigured environment that the institution offered to them. These considerations are consistent with other similar studies (Valtonen, Hacklin, Dillon, Vesisenaho, Kukkonen, & Hietanen, 2012; Salinas et al., 2011). Nevertheless, students added applications for personal use, especially social networks and web services related with media.

It was interesting to see that some students talk about SymbalooEDU as part of their PLE. In most cases, it is useful for them to organize themselves and their different life contexts. Moreover, as the results from the interviews showed, other tools whose use was learned before this course can be integrated into the PLE. We think that these aspects are encouraging to improve the support for merging formal and informal learning. We believe that tools initially provided by the institution do not necessarily need to be restricted to this context; in fact, they might become part of the student's PLE. However, the introduction strategy of the tool may have some influence in this use.

Concerning reflection on their own learning, students and lecturers had to organize their learning and contexts tools in order to build their PLEs in SymbalooEDU. For this purpose, they followed different organization strategies to construct their environments, for example colors, space distribution or icons, among others. The different tools that constitute their PLEs are used with diverse functions, like the ones represented in the maps. This type of things may have sparked off some reflection on their learning in the participants of this experiment.

As for the limitations of the experiment, we can highlight the strategy for the tool's introduction. As stated above, the use of SymbalooEDU was optional and not compulsory for the final assessment of the course. This can also be a strength because students were free to use it and even gave it a personal touch. Another point is that the courses were short: they lasted only 4 months. The experiment runs the risk of being considered an isolated case and being reduced to this type of courses.

Previous familiarity with the use of ICT tools was also considered a weakness, since all the students had attended Educational Technology courses before. They are also

students from education and from a specific university. It is difficult to generalize these results. It would be advisable to extend this type of studies to students from other studies and universities.

In spite of this, some students remarked that organizing the links in SymbalooEDU required more effort than continuing as up to now. This seems to be consistent with the results and considerations of other similar studies, such as the one by Salinas et al. (2011) or Valtonen et al. (2011). Another thing that is highlighted in this study, and also in the latter one, concerns ICT skills and is related to the effort and time spent in building the PLE. Some students' observations focus on a lack of ICT skills to be able to use the application. Therefore, although the ease of use of the tool is notable, students think that their ICT skills are not sufficient to be able to use it.

Another difficulty presented in this experiment is the impossibility of finding out directly what is going on in the students' PLEs. We tried to solve this situation by collecting data from the initial state of the process and afterwards, but it would be worth knowing about the constant evolution in the use of the PLE.

Related to the use of SymbalooEDU to build the PLE, we would like to recall the lecturers' comments concerning this tool. Although according to the SymbalooEDU website, the tool is supposed to be used as a PLE, actually it needs more in order to be a PLE. Actually, it is a tool for organizing access to PLE elements.

6 Future Work

Regarding the continuation of this work, we expect to collect more long-term data from this study and to carry out this experiment with students in the first years of their studies. Configuring their own PLE – with SymbalooEDU or other tools - can be helpful for them and the track that they follow during their university studies may become clearer.

It would also be interesting to consider extending the introduction of the tool in other studies in order to find out whether it is useful to build the PLE in other types of studies or not.

Finally, we will also be considering the usefulness of other types of tools to build the PLE by carrying out experiments like the one above.

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