

PLE-based ePortfolios: Towards Empowering Student Teachers' PLEs through ePortfolio Processes

Gemma Tur Ferrer and Santos Urbina Ramírez

University of the Balearic Islands
{gemma.tur, santos.urbina}@uib.es

Abstract. In this article, according to Cambridge, we try to argue building the networked self improve and empower the construction of eportfolios at the same time that they involve empowering the construction of each student's personal learning environment. As Barrett says, we posit that Web 2.0 tools are suitable tools for the creation of artefacts in the first step of the construction of eportfolios. As stated by Shepherd and Skrabut, we try to argue as well, that these tools that encourage networking and empowering students' PLE, contribute to eportfolio sustainability. Finally, we argue that eportfolios and PLEs have also their main processes in common.

We analyse the use of Web 2.0 tools for the creation of artefacts in our eportfolio case study. Although we cannot prove our students' eportfolio sustainability, at this point of our on-going project of eportfolios in Teacher Education, at the University of the Balearic Islands, Ibiza headquarters, we can still analyse our students' beliefs in the role of technology in their learning and in their teacher identity, which is still in construction. As we said last year, during the first school year of implementation, there was a large group of students with a negative attitude towards technology, although we can now say that most of them have evolved considerably. Some of them still think that technology fails to enrich their own learning process but in spite of this fact, all of them appreciate that the introduction of technology will have a positive effect on their teaching in the future.

Keywords: eportfolio, PLE, Web 2.0, teacher education, PLE-based eportfolios

1 Introduction

Zubizarreta does not see the influence of technology as disrupting for eportfolio methodology, as can be understood from these lines:

“The landscape of portfolio development has expanded astonishingly with the advent of multimedia, hypermedia, database structures, “mashup” applications, blogging and social networking, and more innovations in the digital word. Though the media have changed from print on paper to electronic hypertext and cyberspace the fundamental process of learning portfolio development remains steadfast” (Zubizarreta, 2009, 64).”

Cambridge argues that technology has a key role in the construction of eportfolios as can likewise be understood from these lines:

“Not only can technology contribute significantly to each stage of the composition and use of eportfolios, but it can also play a central role in the eportfolio as a composition, become part of its content, and shape the way readers use it to create meaning” (Cambridge, 2010, 188)

Other authors also consider the beneficial and critical influence of technology on the construction of eportfolios. For instance, Yancey (2004) and Tosun and Baris (2011) focus on the possibility for complex organisation and text composition that hypertext offers to the construction of eportfolios. But the influence of technology on the construction of eportfolios can focus especially on the empowerment of students’ PLEs.

2 ePortfolios and PLEs: a Strong Relationship

2.1 Common Processes and Tools

It could be argued that the strong relationship of eportfolios and PLEs can be demonstrated both through the use of tools and through the learning processes involved in each.

On the one hand, the use of tools to document and collect learning in the construction of eportfolios can empower students’ PLEs.

As Yancey (2004) argues that not all kinds of electronic portfolios can enhance the composition process of eportfolios, in the same way it could also be argued that these electronic portfolios do not enhance the construction of PLEs either. Therefore, it can be argued that both the electronic lineal documents and online assessment systems for the construction of eportfolios do not enhance either the writing process or the use of Web 2.0 tools. However, Yancey (2004, 750) claims that other software can work as a “gallery” empowering multiple and complex contexts, forms of display, connexions and relationships. Thus, this kind of eportfolio software, which can be understood as Web-based eportfolios, could also be considered a way of empowering students’ PLE.

According to Barrett (2009, 2010, 2011) there are three different steps in the construction of eportfolios that develop in a continuum from a chronological to a thematic eportfolio. The first one is based on the construction of artefacts and the second step focuses on the chronological collection of these artefacts accompanied by a reflection based on that single learning. These two steps have learning as a main objective: documenting learning and reflection for learning. Finally, the third step is based on the activity of reorganizing all the collected evidence in new thematic blocks such as competence-based or goal-based topics. The aim of this last step is presenting learning, for example, for assessment, and this is why it is referred to as a showcase or assessment eportfolio. The reflection in this last step is not based on a single piece of evidence but learning process as a whole. Therefore, it seems that the first step, which consists of the construction of artefacts, involves enhancing students’ PLEs. While she mostly talks about audio, video and other presentations tools, in this article it is argued, particularly, that Web 2.0 tools allow the creation of a wide range of artefacts.

Cambridge (2009, 42) argues that there are two selves in the construction of an eportfolio, the networked and the symphonic self. The first one is focused on networking, connecting artifacts and gadgets, quickly collecting evidence of learning and a brief reflection during the learner’s daily life. The selection of tools for networking is in itself a process that communicates about the learner’s own identity. All these activities are integrated into everyday life, which means that this self is based on chrono-

logical documentation of learning, just like the first two steps in Barrett's model. The symphonic self reorganizes all this daily and messy activity into thematic topics so that learners can show authenticity and integrity (Cambridge, 2009, 2010) in their identity as learners, which is a challenging goal for eportfolio authors. This self needs time and calmness for deep reflection that can help to connect artefacts and evidence among themselves and give a global vision of the whole learning process, again just like the third step in Barrett's model. Therefore, while the second focuses on achieving "integrity" (Cambridge, 2009, 42), the first one focuses on the integration of blogs and social software in the eportfolio processes, which can be argued again as enhancing students' PLEs.

Moreover, Cambridge (2010, 199) also claims that "the tools that support eportfolio practice can be seen as a subset of the technology that supports learning more generally". Therefore, the selection of tools has to be made considering various eportfolio processes, which he considers to be five: capture, management, reflection, synthesis and analysis.

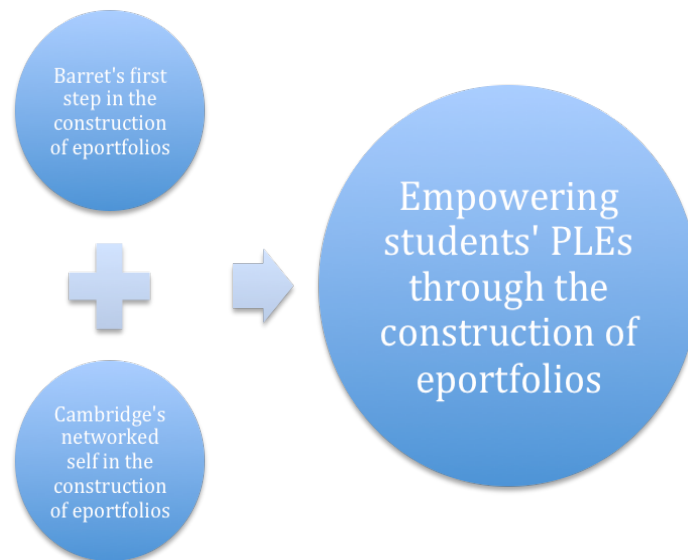


Fig. 1. Empowering PLEs through the use of technology in the construction of eportfolios

For Shepherd and Skrabut (2011, 34) a way to ensure eportfolio sustainability is through the integration of PLEs "to extend individual considerations into eportfolio tasks". PLE-based eportfolios can be more compatible with the ever-changing needs of education, and can also provide greater flexibility. However, some other problems have arisen due to the integration of PLEs into eportfolio tasks, such as anxiety about the instability of tools and privacy issues.

Nonetheless, there are some habits in the networked self that can also be drawbacks for the construction of eportfolios, especially the ones related to blogging habits that differ from typical eportfolio composition. Typical eportfolio composition is "updated less frequently" (Cambridge, 2010, 177) while blogging habits make users blog continuously.

On the other hand, the typical eportfolio processes can also enhance students' PLEs and PLEs can empower the construction of eportfolios. In fact, eportfolios and PLEs have their main processes in common as is argued in the following paragraphs.

Zubizarreta (2009) says that there are three main processes in the construction of portfolios, whether they are paper-based or paper-less portfolios: documenting, reflecting and collaborating. Adell and Castañeda (2010), following Attwell (2007), argue that there are three processes: reading, reflecting and sharing. So, firstly, reflecting on learning is a basic process which eportfolios and PLE have in common. However, some slight differences in both reflection processes can also be observed. In eportfolios, reflection is generally aimed at developing metacognition skills. In PLEs, reflection may also involve the processes of creating, writing, analysing and publishing. Thus, reflection in PLEs also includes the documentation process of eportfolios. Secondly, collaborating and sharing are also processes with a lot in common, although sharing might be something wider than collaborating, because sharing refers to publishing on the web whereas collaborating, in Zubizarreta's model, refers to the relationship between students and teachers through eportfolios. Finally, reading is the process that is part of the PLE process and not of the eportfolio process. Anyway, it is the key element for optimal reflection processes. Thus, the reading process of PLEs guarantees the access to the best sources of information that can enhance further learning processes.

The agreement of processes between eportfolios and PLEs is graphically demonstrated in the following figure:

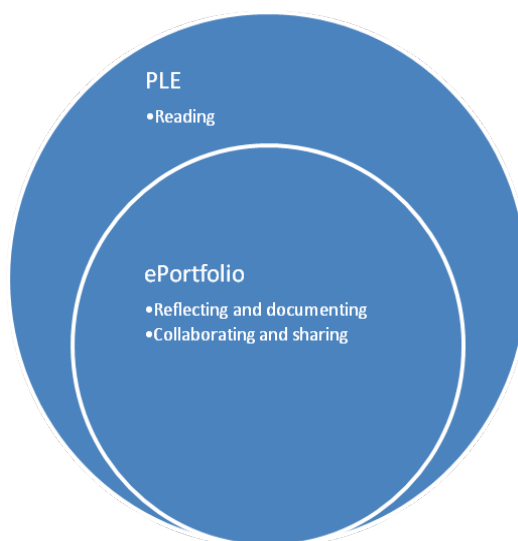


Fig. 2. Processes in common in eportfolios and PLEs

From this evidence of the similarity of eportfolio and PLE processes, it can also be argued that PLE tools enhance eportfolio processes as well. Starting from Adell and Castañeda's definition (2010) of PLEs, there are three kinds of tools: to access information, to create and edit information and to share with others. If tools to access information can support the reflection process in PLEs, they can also support the reflection process in eportfolios. Tools to share information in PLEs can also support the

collaboration process in eportfolio. And finally, although tools to access information do not support any eportfolio process directly, they are capital as they promote a greater quantity and quality of information sources than can improve documented learning in eportfolios. The following figure shows graphically how PLE tools can also improve eportfolio processes:

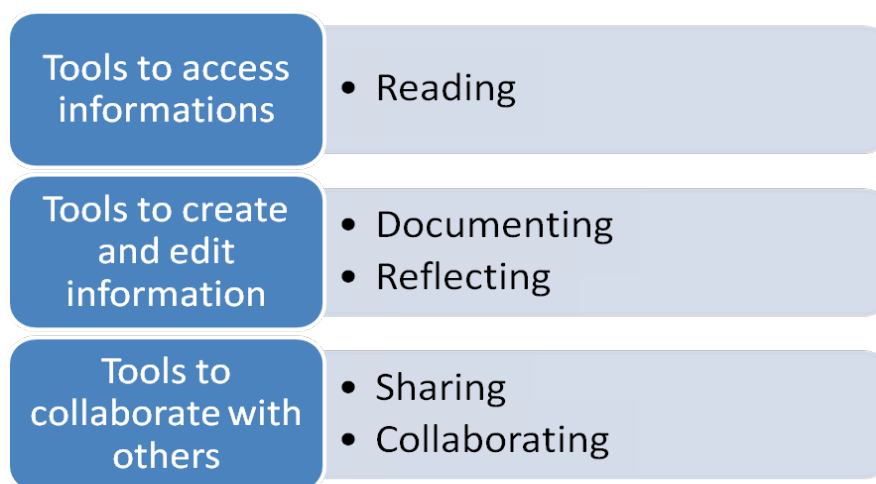


Fig. 3. PLE tools to support eportfolio and PLE processes

2.2 The Self-Regulated Learning Cycle: an Aim in Common?

There are two research programs that have attributed the same aim to eportfolios and PLEs: the self-regulated learning cycle conceptualized by Zimmerman (2000). Abrami et al. (2008) argue that eportfolios encourage self-regulated learning and Dabbagh and Kisanas (2012) state the same about PLEs. However, further research is needed to show more evidence, as the first research failed to prove its hypothesis with the data obtained, and the second was not tested empirically.

Zimmerman's self-regulated learning cycle has got three phases as Abrami et al. (2008) and Dabbagh and Kisanas (2012) have stated: the forethought phase, the performance phase and the self-reflection phase. Dabbagh and Kisanas (2012) developed a pedagogical framework of three levels to work on this cycle through the development of students' PLEs. Their three levels are typically eportfolio processes as well. Level 1 is about creating a space for learning and managing content. The second one is about engaging "in basic sharing and collaborative activities" (Dabbagh and Kisanas, 2012, 6). Finally, the third level involves documenting learning and reflecting on it, as can be understood from this quote: "instructors encourage students to use social media to synthesize and aggregate information from level 1 and level 2 in order to reflect on their overall learning experience" (Dabbagh and Kisanas, 2012, 6). Therefore, as the main activity of each level of this theoretical framework of self-regulated learning in PLEs is based on typical eportfolio activities too, it could be argued that Zimmerman's cycle can be worked both from an eportfolio or a PLE point of view.

2.3 General Conceptual Revision

To conclude, a general conceptual revision of this relationship can also be argued. Ravet and Attwell (2007) define the eportfolio as the DNA of POLEs, acronym that joins together Personal and Organizational Learning Environments. ePortfolio is the identity card of people and organizations that manage their own learning in a distributed learning environment, beyond LMS. Ravet and Attwell (2007) defined and summarised the relationship of eportfolios and PLEs or POLEs as follows:

“To use a biological metaphor, one could say that the ePortfolio is the DNA of the PLE: it is what makes the PLE what it is. Without an ePortfolio a PLE is nothing more than a glorified LMS or VLE. The *raison d’être* of a PLE (POLE) is to create the learning space/landscape where the person (organisation) will construct his/her (its) identity, the ePortfolio being the synthesised representation of this identity leading to further learning and transformation. The ePortfolio is a DNA in constant mutation, reflecting the constant transformation that learning carries” (Ravet and Attwell, 2007).

Later Attwell (2007, 57) discusses the implications of this biological metaphor and states that eportfolios would be “on a developmental continuum, both technically and pedagogically”.

Accepting the validity of these statements, we also claimed in the Master’s thesis presented last year, that eportfolios are the central part of PLEs. PLEs are about reading, creating, connecting and sharing but eportfolios are about making all these processes significant for one’s own learning. Therefore, following the biological metaphor coined by Ravet and Attwell (2007), it could also be argued that eportfolios are the heart of PLEs. The following graphic was designed to show this relationship between eportfolios and PLEs (Tur, 2011a):

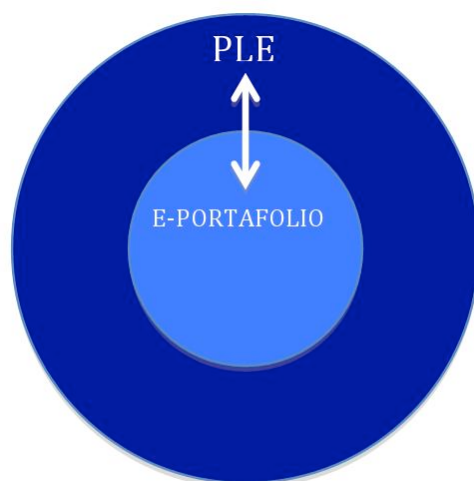


Fig. 4. ePortfolios as the heart of PLEs. Tur (2011a)

3 Case study

Students of Teacher Education at the University of the Balearic Islands, Ibiza headquarters, are integrating eportfolios into the curriculum as a whole. It means that each semester, there is at least, one subject whose assessment is linked to the eportfolio. The eportfolio software is based on Web 2.0 tools, so students are at the same time, extending their PLE. There are two main aims for this project: the first is that students document their learning at University in their eportfolio, and at the same time, extend their PLE. The second aim is that students, while building their own eportfolio and extending their PLE, are developing positive attitude towards technology in their current learning and future teaching.

3.1 The Group of Students

The participants are a group of student teachers consisting of thirty students in the first year and twenty-five in the second. They are all studying to become Infant Education Teachers.

3.2 Research Questions

We have various research questions regarding both students' eportfolios and PLEs. However, we will only focus in this article on the research questions related to PLEs:

- Will students expand their PLEs through the construction of eportfolios based on Web 2.0?
- Will students develop a positive attitude towards the integration of technology in their current learning at University and their future teaching at schools?

3.3 Method and Data Collection Instruments

We follow their digital prints in their eportfolio to see which Web 2.0 they are using and the progressive extension of their PLE, and every year, we collect data both quantitative with questionnaires based on a Likert scale developed by Lin (2008), and qualitative with interviews and group discussion.

3.4 Findings

The findings about the number of students using Web 2.0 tools and the number and variety of tools used by students uncover a positive evolution during the first two years of eportfolio implementation. While during the first school year of implementation only a few students consistently started their eportfolios and used some tools of the Web 2.0, during the second school year all students definitely started their eportfolio and expanded the number of tools used. This increasing usage of tools can be deduced from the following data about the two school years:

Table 1. Web 2.0 tools used by students during the school year 2010-11

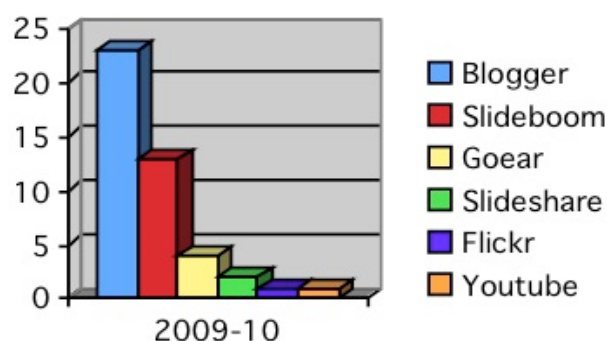
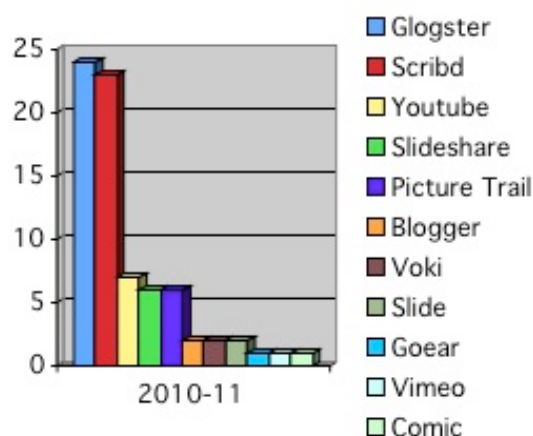


Table 2. Web 2.0 tools used by students during the school year 2010-11



As can be seen, most students opened their blogs during the first year, but only a few students started using a few tools. A year later, the last two students who still had to open their blogs, finally were able to do so, and what it is important is that many students started using many more tools too. Glogster was a successful learning tool used with creativity by many students as we have already highlighted (Tur, 2011a).

As for students' attitude, the data also uncover a positive evolution. After two school years learning with technology, documenting their eportfolio and expanding their PLE, students developed quite a positive attitude towards technology. They answered a questionnaire about their attitudes towards the construction of a learning eportfolio and towards technology in their current learning and future teaching. The survey was based on a Likert scale which was created by Lin (2008) for an eportfolio research. Students had to answer choosing the option they considered most appropriate from 5 (strongly agree) to 1 (strongly disagree). We have only selected seven questions (2, 7, 11, 12, 14, 16 and 17) which had to do with the use of technology both

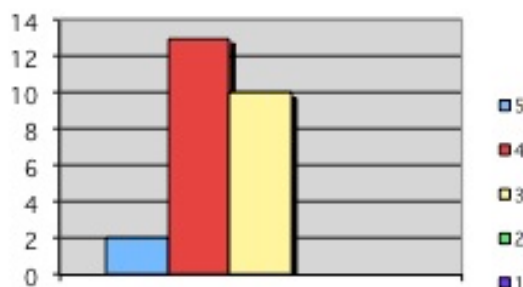
for learning and teaching and which have some kind of relationship with PLEs, which is the main aim in this article.

There are questions asked in a positive (questions from 1 to 3 and 6) and in a negative sense (questions 4, 5 and 7). It can be observed that students' answers are coherent, and so questions formulated in a positive style receive a higher positive rating, whereas the same questions formulated in a negative style receive a higher negative rating by students.

After the process of constructing my eportfolio, I ...

- a) gained greater confidence in learning new technology applications such as working with hypermedia software.

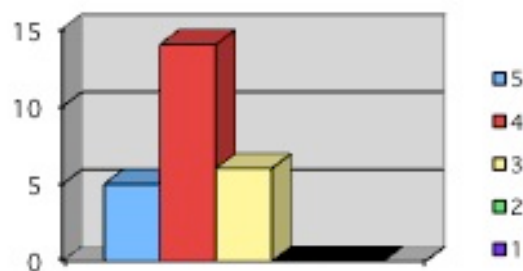
Table 3. Students' greater confidence in learning ICT new applications



The vast majority of students think they have developed greater confidence in using new technology tools.

- b) gained greater confidence in integrating new technology in future classrooms.

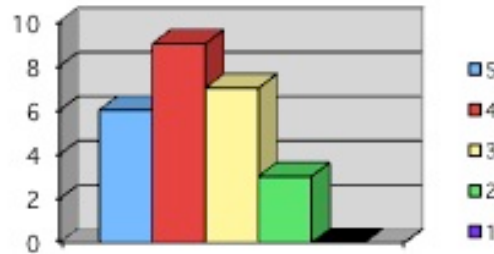
Table 4. Students' greater confidence in integrating ICT in future teaching



This question is crucial for our study as one of the main aims of the whole project is that this learning experience be useful for them as future teachers. Therefore, it is hopeful that the majority of the students feel sufficiently confident to integrate technology in their future teaching.

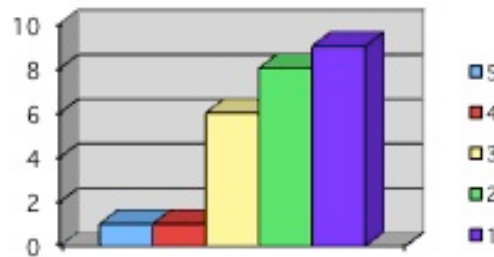
- c) was able to review my existing technology skills while gaining additional ones.

Table 5. Students' technology skills



Students admit learning new skills in the use of technology.
d) became less confident in integrating technology in future classrooms.

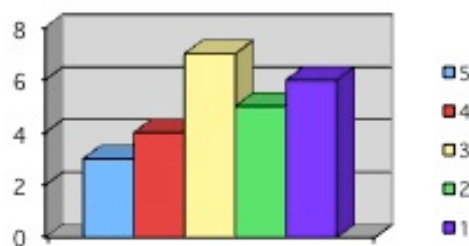
Table 6. Student's decreasing confidence for technology integration in future teaching



The vast majority of students strongly disagree with this question, which is coherent with the answers to question 2. It is also very important for this research that the results are coherent so we can have valid data about students' beliefs of their future professional use of technology.

e) felt challenged and overwhelmed with technology.

Table 7. Students' negative feelings towards technology

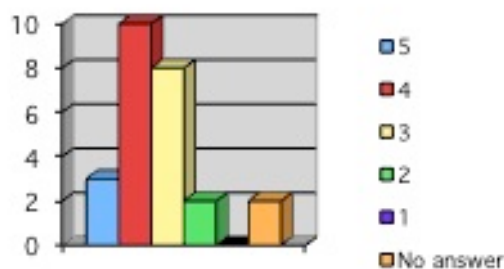


This question is also coherent with the rest, because the number of students who answered negatively is higher than the students who answered positively. However, there is an important number of seven students who agreed with overwhelming feel-

ings. Actually, this was also observed last year as most students did not start in a their eportfolios in an adequate way (Tur, 2011b) due to anxiety and other feelings stated through qualitative research.

f) learnt a lot from communicating, interacting and collaborating with peers.

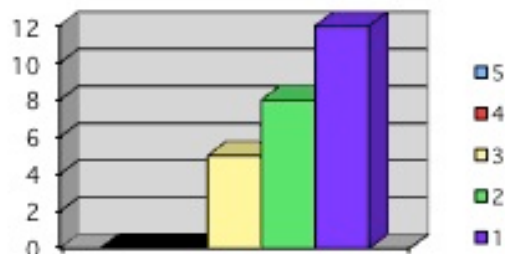
Table 8. Students' learning through collaboration



Collaboration is a common process in eportfolios and PLEs, as has already been argued, and a key competence for teachers of the 21st Century, so it is positive that students value learning by collaborating with others through the use of technology.

g) did not learn any additional technology skills.

Table 9. Students' failure to learn new skills technology learning



Finally, this question is absolutely coherent with question 3 with most answers in disagreement with the statement.

4 Conclusions

Nowadays, students are building their networked selves, in Cambridge's words, or in Barrett's words, they are in the first and second step of the construction of their eportfolios. Thus, they are also especially devoted to expanding their PLEs through the use of Web 2.0 tools. To answer research question 1, as can be observed from the evolution of tools used by students, it seems that through the construction of eportfolios students are empowering their PLEs, despite the fact that this expansion of tools is going slowly than was planned, due to some negative attitudes observed at the beginning of the project (Tur, 2011b).

Also, we can answer in a positive way research question 2. It has been demonstrated that most students have developed quite a positive attitude towards technology, which allows us to expect a certain sustainability of their eportfolios during their professional careers.

These results are not final, as the project has not yet concluded, and the data was collected as a reference of students' beliefs halfway through the project. Furthermore, we think that these results could be indicative of the final results to be obtained in two years time. Although we still hope that the vast majority of student teachers integrate technology in their teaching careers, it could be that students who have not taken this step so far will not do so during their remaining time at University.

References

1. Abrami, P., Wade, A., Pillay, V., Aslan, O., Bures, E., Bentley, C.: Encouraging self-regulated learning through electronic portfolios. In *Canadian Journal of Learning and Technology*, 24(3) (2008)
2. Adell, J., Castañeda, L.: Los entornos personales de aprendizaje (PLEs): Una nueva manera de entender el aprendizaje. In Roig vila, R. I Fiorucci, M (eds.) *Claves para la investigación en innovación y calidad educativas. La integración de las tecnologías de la información y la comunicación y la interculturalidad en las aulas. Stumenti di ricerca per l'innovazione e la qualità in ámbito educativo. La tecnologie dell'informazione e della comunicazione e l'interculturalità nella scuola*. Alcoy: Marfil - Roma TRE Università degli studi (2010)
3. Attwell, G.: E-Portfolios- the DNA of the Personal Learning Environment? In *Journal of e-Learning and Knowledge Society*, 3(2), 39-61 (2007)
4. Barrett, H.: Balancing two faces of eportfolios. Retrieved from <http://electronicportfolios.com/balance/index.html> (2009)
5. Barrett, H.: Balancing the two faces of eportfolios. In *Educação, Formação & Tecnologias*, 3 (1), 6-14 (2010)
6. Barrett, H.: Balancing the two faces of eportfolios. In Hirtz, S. y Kelly, K. (ed.) (2011) *Education for a digital World 2.0. Innovations in Education. Volume 2*. British Columbia Ministry of Education. Retrieved from: http://openschool.bc.ca/info/edu/7540006133_2.pdf (2011)
7. Cambridge, D.: Two faces of integrative learning online. In Cambridge, D.; Cambridge, B. and Yancey, K (2009) (editors): *Electronic Portfolios 2.0. Emergent Research on Implementation and Impact* (pp. 41-49) Virginia: Stylus (2009)
8. Cambridge, D.: *Eportfolios for Lifelong Learning and Assessment*. San Francisco: Jossey-Bass (2010)
9. Dabbagh, N., Kitsantas, A.: Personal Learning Environments, social media and self-regulated learning: a natural formula for connecting formal and informal learning. In *Internet and Higher Education*, 15, 3-9 (2012)
10. Lin, Q.: Preservice teachers' learning experiences of constructing e-portfolios online. In *The Internet and Higher Education*, 11(3-4), 194-200 (2008)
11. Ravet, S., Attwell, G.: POLE: Personal & Organisational Learning Environment. In: *ePIC Proceedings*. Retrieved from: <http://www.eifel.org/publications/eportfolio/proceedings2/ep2007/papers/eportfolio/pole/view> (2007)
12. Shepherd, C.E., Skrabut, S.: Rethinking Electronic Portfolios to Promote Sustainability among Teachers. In *TechTrends*. 55 (5), 31-38 (2011)
13. Tonsun, N., Baris, M. F.: E-portfolio applications in education. In *The Online Journal of New Horizons in Education*, 1 (4), 42- 52 (2001)

14. Tur, G.: Eportafolis a la formació docent inicial. Estudi de cas d'un projecte d'eportafoli per a la integració de les TIC als estudis de Grau d'Educació Infantil de la Universitat de les Illes Balears a la Seu d'Eivissa. Master Thesis. University of the Balearic Islands. Not-published (2011a)
15. Tur, G.: Glogster in pre-service teacher education. Pechakucha. Education in a Changing Environment International 6th Conference. 6-9 July 2011, Salford University, UK. Retrieved from: http://www.ece.salford.ac.uk/programmes-2011/papers/paper_137.pdf (2011b)
16. Tur, G.: Eportfolios and PLEs in Teacher Education. First results. In: Proceedings of the The PLE Conference 2011 (pp. 1-10), Southampton, UK. Retrieved from: <http://journal.webscience.org/578/> (2011c)
17. Yancey, K.: Postmodernism, Palimpsest, and Portfolios: Theoretical Issues in the Representation of Student Work. In *College Composition and Communication*, 55 (4), 738-761 (2004)
18. Zubizarreta, J.: *The Learning Portfolio. Reflective Practice for Improving Student Learning*. Second edition. San Francisco: Jossey-Bass (2009)