Learning on the Move: The Role of Mobile Technology in Eportfolio Processes for Self-regulated Learning

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Resumen: Este artículo explora las posibilidades de la tecnología móvil para los diversos procesos que llevan a cabo los estudiantes de educación a través del diseño de un eportfolio orientado al aprendizaje autorregulado. El marco teórico cubre el ciclo autorregulado, los procesos de eportfolio y el potencial de los dispositivos móviles para ambos, así como la creatividad. La investigación adopta la forma de un estudio descriptivo con fines exploratorios que busca obtener datos cuantitativos con un instrumento de escala Likert. En particular, la recopilación de datos explora los usos de sus dispositivos móviles realizados por los estudiantes en la construcción de sus eportfolios. Los resultados muestran que la colaboración y construcción de artefactos son los procesos del eportfolio que se llevan a cabo principalmente con estos dispositivos móviles.
Palabras Clave: tecnología móvil, mportfolio, eportfolio, creatividad, formación del profesorado, aprendizaje autorregulado.

Abstract: This article aims to explore the possibilities of mobile technology for the diverse processes performed by undergraduate student teachers through the design of an eportfolio oriented towards self-regulated learning. The theoretical framework covers the self-regulated cycle, eportfolio processes and the potential of mobile devices for both of these as well as creativity. The research takes the form of a descriptive study with exploratory aims seeking to obtain quantitative data with a Likert scale-based instrument. In particular, data collection explores the usages of their mobile devices made by students in the construction of eportfolios. Results show that collaboration and construction of artefacts are the eportfolio processes mostly carried out with these mobile devices.
Keywords: mobile technology, mportfolio, eportfolio, creativity, Teacher Education, self-regulated learning.

1. Introduction

There has been extensive research on the use of mobile technology in education but less about student perceptions of the possibilities of this technology for learning (Serin, 2012). Moreover, the use of mobile technology in the construction on eportfolios in higher education was initially carried out from a technical perspective - see for example, the work by Corlett, Chan, Tingand and Sharples (2005) in which a Personal Learning Environment (PLE) system integrating mobile devices is explored; or more recently, the work by Barrett (2011) about the possibilities of different devices and tools in the construction a wide range of artefacts. Since then, extensive work has been done on the integration of mobile technology in a support of learning with different objectives such as learning in context or self-regulated learning (Lai &

Wu, 2016). Zimmerman (1990, p. 14) defined self-regulated learners as students who carry out a "systematic use of metacognitive, motivational and behavioural strategies", related to planning, controlling and monitoring, as well as self-assessing learning (Zimmerman, 2002, pp. 67-69).

This paper reveals some previously little unexplored aspect, since perceptions and beliefs on the affordances of mobile technology for learning processes on eportfolios have been very much overlooked. Exploring student teachers' perceptions is crucial since the successful integration of ICT depends to a large extend on their attitudes and beliefs (Teo, 2008; Teo, Lee & Chai, 2008; Teo, 2009; Prestridge, 2010). Following Hermans, Tondeur, Braak and Valcke (2008), the current research is based on a learning activity designed to provide an early experience that helps students shape their beliefs towards the affordances of mobile technology. Furthermore, going beyond the exploration of perceptions, the current work presents a theoretical model for the integration of mobile technology in the eportfolios processes. Based on a previous work (Tur & Camacho, 2012), there was observed a need to design an eportfolio model integrating mobile technology for the diverse processes required for the fostering of self-regulated learning.

2. Mobile technology in education for self-regulated aims

Stemming from their learning and teaching experiences, Sha, Looi, Chen and Zhan (2012) proposed an analytic self-regulated learning model for the design and analysis of mobile learning. At the centre of that model they present the notion of self-regulation as an agency, "referring to the learner characteristics that function as internal driving forces initiating and sustaining a self-regulated mobile learning process", such as domain knowledge, prior experiences, motivation, and metacognitive awareness or epistemological beliefs. In this sense, mobile learning processes could be considered as exercises of agency according to self-regulated learning theories, are mediated by mobile technologies and devices as social, cognitive, and metacognitive tools; and could offer learners some degree of learning autonomy in setting goals, monitoring and controlling learning processes, assessing, and evaluating learning activities (Sha, Looi, Chen & Zhan, 2012, p. 376).

Kearney, Schuck, Burden and Aubusson (2012) had also argued that three key features of mobile learning are personalisation, authenticity and collaboration. The personalisation feature includes customization, learner choice, agency and self-regulation. These authors insist on the implications of the characteristics of mobile learning for self-regulated learning in controlling over the place, pace and time the students learn, or the possibilities for setting their own learning goals.

Some educational experiences had already explored the use of mobile technology for self-regulated learning aims. For instance, Shih, Chen, Chang and Kao (2010) proposed a self-regulated m-learning system aimed at constructing a mobile and personalised learning environment for secondary school learners which could be used anywhere and anytime, with the initial support of instructors. Ramírez Montoya (2016) describes the institutional implementation experiences of mobile learning strategies at a whole university level aimed at providing greater flexibility of access to educational contents, personalisation of learning experiences, development and enhancement of professional abilities and higher effectivity in learning. Bidaki, Naderi & Ayati (2013) discovered the positive effect of mobile learning on academic achievement and self-regulation in a study in the area of medical sciences in higher education. Barcena and Read (2015) noted the enhancement of self-regulated learning through the use of an app for adult second language learning. Those are all educational

experiences related to the enhancement of self-regulated learning through the use of mobile devices. However, they do not really address the eportfolio processes.

3. Mobile technology for creativity in education

There has been an important link based on the possibilities of digital creation such as video editing and storytelling for the development of student creativity towards self-reflection skills (Correa, Jiménez & Gutiérrez, 2009; Kirk & Pitches, 2013; Potter, 2006; Tackvic, 2012), within self-regulated learning actions. For instance, McGreen and Arnedillo (2005) explored the potential of mobile technology to perform learning experiences designed to boost creativity - the creation of digital narratives through narrative and digital video production - in a learning activity with teenagers involved in an out-of school Computer club in Dublin. However, beyond the creation of artefacts for critical thinking and content generation, the current context of ubiquitous access to mobile technologies along with the possibilities of social media for collaboration offers, among other elements, an extraordinary opportunity for creative student-centred learning opportunities (Cochrane, Antonczak, Keegan & Narayan, 2014; McGreen & Arnedillo, 2005). McGreen and Arnedillo (2005) highlight that the main challenge for educators is to create a learning environment which fosters creativity and encourages the students to express themselves in an imaginative way. For that purpose, according to the same authors, some characteristics should be fostered: the openness to possibility (alternative paths), the willingness to take risks, experimentation and exploration, and the use of prior knowledge in new ways. Cochrane et al. (2014) have argued that mobile social media in formal contexts require a profound rethink of the pedagogical model - and thus, assessment – focusing on three main strategies similar to those of heutagogy (Blaschke, 2012): learner negotiation, reflective practice and collaborative learning.

In this sense, Ahonen and Murto (2004) proposed a research framework that enhances the integration of a digital portfolio into long-term learning and creativity processes. This framework stems from design-based research and the elements for creativity. These are: domain relevant skills (expertise), relevant creative-thinking skills and task motivation. Ahonen and Murto (2004) suggest that, while digital portfolios traditionally support expertise building and presentation, creative-thinking skills could be taught to some extent and tools that support these skills can be integrated into digital portfolios. Extrinsic motivation one could be supported with guidelines and instructions on how to maintain a portfolio while the intrinsic motivation stems purely from the learner's personal interests and could therefore be difficult to support.

4. Eportfolios in education for self-regulated learning

Zubizarreta (2009, p. 20) defines learning portfolios as "a flexible, evidence-based tool that engages students in a process of continuous reflection and collaborative analysis of learning". For Zubizarreta the maximum level of a learning portfolio is accomplished through three processes: documentation, reflection and collaboration. Reflection has been defined as "the process by which we think about how we learn" (Yancey, 2001, p. 17). Moreover, it also helps to establish new links between previous knowledge and future learning (Wade and Yarbrough, 1996; Lin, 2008). Parkes, Dredger and Hicks (2013, p. 102) argue that "reflecting means being intentionally thoughtful about defining an experience, explaining that experience, and determining future implications and actions". Reflection is also considered to foster creativity skills (O'Keeffe & Donnelly, 2013). Collaboration (Zubizarreta, 2009) or social learning

(Garrett, 2011) has been considered as one of the key elements in the design of an eportfolio project, although most software focuses on security and privacy instead of fostering social exchange (Garrett, 2001, p. 189).

The construction of artefacts is not a specific eportfolio process but is one of the main parts of the evidence on which an eportfolio is based. An artefact is defined by Jones (2011, p. 80), as "a digital resource used to present, inform, and support learning. In the purest sense, an artifact is considered a learning object because it is a digital object signifying a specific unit of learning". The connection of eportfolios and creativity has not been extensively explored either. However, there is a considerable amount of research on reflection, which represent a clear link with creativity when considered as a cognitive process. In this sense, Mailles-Viard and Albernhe-Giordan (2010) have observed the possibilities of eportfolios for a flexible design of learning and thinking differently.

Reflection is inherent to eportfolio, as Zubizarreta's model suggests (2009). However, there is a broader line of research linking eportfolio with self-regulated learning, which tackles not only reflection as a single metacognitive skill but also others that are strongly related. Zimmerman's cycle (2002) includes reflection as the third phase of the model, but previous phases also demand other skills that demand the development of metacognitive skills such as goal setting (forethought phase) or monitoring learning (performance phase). Therefore, there are studies that have implemented eportfolios in order to foster students' self-regulated learning skills in diverse contexts - see, for example, Alexiou and Paraskeva (2010; 2013; 2014); Cheng and Chau (2013); Yastibas and Yastibas (2015).

5. The study

5.1 Context: the mportfolio project in teacher education

The implementation of eportfolios for self-regulated aims has been carried out at the centre of the University of the Balearic Islands in Ibiza from the school year 2009-10 to 2015-16. Student teachers are asked to document their learning during each term in the course, and this is assessed through eportfolio work. Students are asked to document learning through blogs and carry out a capstone assessment submitting a presentation eportfolio based on Google Sites. Since the school year 2011-12, mobile technology has been included in the learning design of the eportfolio work as a non-compulsory element. Students are asked to use their own mobile devices to construct artefacts (take photos, record video and audio file), take notes on the move for reflection in action and connect with classmates for peer assessment.

5.2 Method

The current study is aimed at exploring student perceptions towards the use of mobile technology in eportfolio processes and the creativity skills involved. Therefore, it is an exploratory study of a descriptive nature, which employs a quantitative methodology through the application of a questionnaire. This instrument was designed to explore student perceptions of the portfolio processes that we argue could be enhanced through the use of mobile technology, and used a Likert scale with 16 questions. Three questions (questions 1, 2 and 4) are about student perceptions in general, and six are about student perceptions of their own usage of mobile technology in eportfolio processes (questions 7 and 7.1., 7.2., 7.3., 7.4., 7.5.). A set of three more questions (questions 4, 5 and 6) are based on access to eportfolios using mobile technology, which certain extent represents one step towards the usage of mobile technology in learning, although it cannot be considered as an eportfolio process per

se. The questionnaire also includes four final questions (questions 8, 9, 10 and 11) on student perceptions of their use of mobile technology in their future teaching.

5.3 Research questions

The research questions are the following:

- Which eportfolio processes are enhanced by the introduction of mobile technology?
- Do students develop a positive attitude towards mobile technology in education and in eportfolio?

5.4 The sample

The group of participants consists of 67 students -17 male, 49 female and 1 n/a. Most of the students were born after the eighties: 40 students are aged between 20 and 25; 20 between 25 and 30; and, 7 between 30 and 35. None of them has ever had either a blog or an eportfolio, although most of them habitually use social networks like Facebook. They are undergraduate students in our Teacher Education programme to become Early Childhood Education or Primary Education teachers; or postgraduate students with a BA in a wide range of subjects attending a Master in Secondary Education course in order to become teachers in Spanish Secondary schools.

5.5 Findings

All the students answered the ten questions on general perceptions about learning and teaching with mobile technology and the usage of mobile technology, and only 56 out of 67 students were able to answer the six questions about their own way of using mobile devices in the construction of eportfolios. This means that only eleven students made no use of their mobile devices in their own eportfolio processes. This is not a large number of students in itself, but taking into account the small size of the group, it means a relevant 16.4% of students. We have previously stated that all students had at least one mobile phone and a mobile device such as a camera that could have been used to document learning. Therefore, this proportionally high percentage of students who did not use their mobile technology for eportfolio processes was probably because of attitude rather than a lack of technology. Nonetheless, data collected does not allow us to conclude why these students failed to use their mobile technology for eportfolio processes.

The results of students' answers, expressed in percentages, are set out in the following tables.

	A lot	Quite a lot	A little	Not at all	N/A
Can mobile technology enhance learning?	34.3	40.3	1.5	3	20.9
Can mobile technology enhance learning portfolio processes?	29.9	44.8	3	3	19.4

Table **1**. Questions 1 and 2

In general, students seem to have a positive theoretical attitude towards mobile technology although some inconsistencies arise when they are asked about concrete eportfolio processes. Questions 1 and 2 show that the greater part of the group consider that mobile technology can enhance both learning and learning portfolios a lot or quite a lot – more than 70% of students choose the positive answers in both

questions. Nonetheless, the important percentage of students who do not choose any option – about 20% in each is significant.

As regards the question as to whether portfolio processes can be enhanced by mobile technology (question number 3), the overall opinion is also positive, but not to the same extent since there are students who choose the options "a little" and "not at all" in some eportfolio processes.

	A lot	Quite a lot	A little	Not at all	N/A
Documentation	31.3	50.7	10.4	4.5	3
Reflection	15	44.8	25.4	9	6
Collaboration and sharing	59.7	29.8	6	1.5	3
Creation of artefacts	49.2	28.3	12	4.5	6

Table **2**. Question 3

In all processes except for reflection, between 80% and 90% of students answer that mobile technology can enhance the processes of documentation, collaboration and creation of artefacts "a lot" or "quite a lot", and only a very reduced number of students have no opinion or think that these processes can be "little" enhanced by mobile technology. However, reflection, despite also getting positive answers in general, gives slightly lower results because slightly more than half the group consider that mobile technology can enhance reflection "a lot" or "quite a lot", while more than the 30% are divided between different and rather negative answers: about 25% of students state that reflection can only be enhanced by mobile technology "a little", 9% of the group consider that mobile technology cannot enhance reflection "at all", and another group - 6% - has no opinion about this process.

About your own mobile technology usage for eportfolio processes...	A lot	Quite a lot	A little	Not at all	N/A
Have you used your mobile technology to access your colleagues' eportfolios?	19.4	25.4	15	29.8	10.4
Have you used your mobile technology to access your colleagues' artefacts?	13.4	28.3	16.4	40.3	10.4

Table **3**. Questions 4 and 5

Questions 4, 5 and 6 explore student habits of accessing colleagues' eportfolios. Accessing eportfolios is not in itself an eportfolio process although it can be considered as a step towards the integration of mobile technology into eportfolio processes and a way to start collaborating as a true eportfolio process. The results are more or less evenly divided between favourable and unfavourable answers. Thus, nearly half of the group use their mobile technology to access their colleagues' portfolios (question 4) "a lot" or "quite a lot", and nearly half of the others admit to having accessed classmates' eportfolios through their own mobile devices only "a little" or "not at all". The results of question 5 are less positive, as more than half of the group admit to having accessed their colleagues' artefacts "not at all" or just "a little," and only a little more than a 30% of the group have done it "a lot" or "quite a lot".

Where have you accessed your colleagues' eportfolios from?

	A lot	Quite a lot	A little	Not at all	N/A
	35	19	4	5	4
From home, at the usual study place	52.2	28.3	6	7.5	6
From home, doing other things	23.9	32.8	25.4	15	3
From college, in group	9	34.3	29.8	19.4	7.5
On the move	1.5	7.5	25.4	55.2	10.4

Table **4**. Question 6

Question 6 is aimed at discovering if mobile technology is used on the move, thus widening the possibilities of learning beyond places and timetables of traditional study. However, the results show that mobile technology if used at all, is mainly used in traditional ways such as the habitual place of study – about 80% of students answer, "a lot" or "quite a lot" the option "at home, at the usual study place". And a very low usage taking advantage of mobility is evidenced –just 9% of students answer "quite a lot" or "a little" the item "on the move" whereas about 80% answer "a little" or "not at all".

Question 7 "Have you used your mobile technology for your portfolio processes?" and the five following subquestions were limited to students who had really used their own mobile technology for eportfolio processes (n=56) - 83.6% answer "yes" to question 7 -, beyond accessing and beyond general opinions. In all four eportfolio processes, at first glance, it can be observed that students more frequently give the more negative answers, although the vast majority of students who have used their own mobile devices think that their own learning and creativity have been empowered (67.2% and 79.1% answer "yes" to question 7.2 related to learning portfolio processes, and question 7.4 related to creativity, respectively).

In which eportfolio processes have you used your mobile technology?

	A lot	Quite a lot	A little	Not at all
Documentation	19.6	28.6	32.1	19.6
Reflection	7.1	17.9	42.9	32.1
Collaboration and sharing	39.3	41.1	5.4	14.3
Creation of artefacts	37.5	26.8	14.3	21.4

Table **5**. Question 7.1.

Answers to question 7.1 show that the vast majority of students mainly collaborated with their mobile devices since more than 80% of the group answered the item with options "a lot" and "quite a lot". Artefact creation is also a process with quite a relevant activity, since more than 60% of the group answered with favourable options while just over 30% answered with unfavourable ones. On the contrary, the process least carried out through mobile technology is reflection since more than 70% of the group did not reflect using their mobile devices "at all" or only "a little", which means that only slightly over 17% of the group reflect "quite a lot" and none of them "a lot". On the other hand, the process documentation obtained evenly balanced

answers, with approximately half of the group between positive ("a lot" and "quite a lot") and negative answers ("a little" and "not at all").

Which processes?	A lot	Quite a lot	A little	Not at all
Documentation	12.5	32.1	26.8	28.6
Reflection	8.9	26.8	37.5	26.8
Collaboration and sharing	28.6	41.1	14.3	16.1
Creation of artefacts	32.1	28.6	12.5	26.8

Table **6**. Question 7.3.

Question 7.3 is aimed at discovering student perceptions of the empowerment of their own portfolio processes through the integration of mobile technology, and it seems that collaboration and creation of artefacts are the processes most enhanced. Thus, the answers between "a lot" and "quite a lot" represent nearly 70% of the total in the former; and 60% in the latter. Documentation shows agreement in nearly half of the group and, again, the reflection processes are the least empowered since the answers that indicate higher empowerment are only about 30%.

Which processes?	A lot	Quite a lot	A little	Not at all
Documentation	8.9	37.5	33.9	19.6
Reflection	8.9	28.6	42.9	19.6
Collaboration and sharing	26.8	48.2	21.4	3.6
Creation of artefacts	32.1	23,2	21.4	23.2

Table **7**. Question 7.5.

The question on creativity - number 7.5- obtains similar results to the previous questions. The documentation and reflection processes are the ones that are carried out with least creativity when using mobile technology, as few students answer, "a lot" and more than 50% answer "a little" or "not at all". So, fewer than half of the students value the development of their creativity in the portfolio processes of documentation and reflection, and mainly in the "quite a lot" option. Collaboration is the only process that is carried out with major development of creativity as more than 70% of students answer with the options "a lot" and "quite a lot". The rest of the students answer that there is little or no development of creativity in their collaboration process. The creation of an artefact has evenly balanced results, with more than 40% of answers between the options of "a little" and "not at all", and slightly more than 52% of students who think that creativity has been enhanced through the use of their mobile technology "a lot" or "quite a lot".

About your future teaching,…	Yes	No
Will you use your mobile technology in your future teaching?	94	6
Will you empower your students' strategies to use their mobile Technology for learning?	92.5	7.5
Will you ask your students to build their own eportfolio?	94	6
Will you ask your students to use their mobile technology in their eportfolio processes?	83.6	16.4

Table **8**. Questions 8, 9, 10 and 11

Finally, the last four questions, 8, 9, 10 and 11 explore student attitudes towards the usage of mobile technology in their future education careers. Despite the fairly negative results of real usage, students are positive about prospective use. In general, students have a positive attitude towards the integration of mobile technology into their future teaching. In all four questions, more than 80% of students - in fact, in questions 8 to 10, more than 90% - chose the affirmative option and relatively few students answered "no" when asked about encouraging their own students to build a learning portfolio and use mobile technology for eportfolio processes. However, it is relevant to highlight that in this section, the item with the lowest rating is the one related to implementing a similar project for their future students. Data collected do not allow us to go into greater depth as to the reasons why these students would not use mobile technology in their future teaching.

6. Discussion

The promotion of mobile technology has been executed in the framework of a design of eportfolios for self-regulated learning, hitherto addressed in research as can be observed in the literature review. The three phases of this cycle by Zimmerman (1990; 2002) have been defined and studied through the relationship between mobile technology and eportfolios. The questionnaire is focused on eportfolio processes, these being understood as the performance tasks of the self-regulated learning cycle - with the reflective process being considered as a metacognitive task of the performance of eportfolio so as not to generate confusion with the self-assessment task attributed to reflection by the original model.

The results on the role of mobile technology for collaboration are in agreement with earlier research, which considers its affordances to enhance student network and learning with others with handheld devices (Cobcroft, Towers, Smith and Bruns, 2006); and they are also in line with previous research in which the possibilities of eportfolios for collaboration were very much valued by students (Tur & Urbina, 2016). Moreover, it is possible to observe some activity in the documentation of learning along with the creation of artefacts, in alignment with the observation made by Coolin, Harley, Smallwood and Wood (2010). Also, the data collected on concrete portfolio processes demonstrate the difficulties for reflection with mobile technology, which is coherent with the difficulties for reflection in general, which is also highlighted by previous research (Tur, Marín, Moreno, Gallardo & Urbina, 2016).

In terms of creativity, based on the results obtained, we can see that the vast majority of the group think that the use of mobile devices has enabled them to develop their creativity in the context of formal learning, which can extend knowledge since the exploration of creativity in eportfolios in terms of self-regulated learning had been carried out in work-based settings (Ahonen & Murto, 2004). The aspects explored in greater depth allow us to observe in which eportfolio processes creativity has been most developed. Firstly, student teachers think that the processes that can be most empowered by mobile technology are the collaboration and artefact creation processes, which are also considered to most empower their own creativity. Secondly, creativity is observed in processes such as collaboration whereas, unexpectedly, the creation of artefacts, something that benefits from social activities like photo and video editing, obtains unclear results. However, data collected on the development of creativity do not allow us to posit how it was carried out and if it was addressed as a cognitive process for the sharing of ideas and creation of artefacts as observed by previous research (Buchem, Jahnke & Pachler, 2013; Fischer, 2011; Jahnke, 2011). Therefore, the exploration of creativity is a limitation of this study since qualitative

data from student performance would have been essential for an analysis of the terms in which it was carried out.

Data show a generally positive attitude towards the integration of mobile technology into our students' future professional careers. It seems that living a learning experience has helped them to see the affordances of mobile technology for portfolio processes and therefore, to value it for their future teaching, as pointed out by previous research (Camacho & Tur, 2012). This aligns with research on attitude and beliefs on ICT which mainly argues the importance of early experiences to influence on student beliefs (Hermans, Tondeur, Braak & Valcke, 2008) which are paramount for effective usage with their future students (Lindstrom, Schmidt-Crawford & Thompson, 2016).

Also, data obtained confirm Kazlauskas and Robinson's (2012) research that points out that mobile technology is not as yet maximized for the enhancement of ubiquitous learning. Likewise, the results of question number 3, which allow us to think that mobile devices have not been used on the move and thus have not expanded the possibilities for learning in non-formal contexts, are in alignment with previous results in a research based on a podcast activity (Tur, 2013). However, these results also reveal some interesting habits such as group access to colleagues' eportfolios and artefacts, which is in agreement with Zahn, Krauskopf, Hesse and Pea's (2012) results that evidence some kind of facilities of mobile technology for student and peer collaboration.

7. Conclusion

In conclusion, from a theoretical point of view, and after having considered Zubizarreta's model with mobile technology (Tur & Camacho, 2012), a new step forward is required in order to observe its affordances in greater depth. It can be argued that mobile technology can encourage the main eportfolio processes: documentation, reflection and collaboration, and also, the creation of artefacts. Therefore, we can infer that mobile technology allows us to reflect-in-action, document on the move and collaborate with others anytime, anywhere. This model presents interesting possibilities as it offers a pedagogical approach which would go beyond the use of mobile technology for the delivery of content and explores its possibilities for the construction of eportfolios for self-regulated learning aims. It seems extremely interesting both for educational implementation and research to define a framework for self-regulated learning which creates a role that goes beyond offering an environment for mobile technology, including the empowerment of the possibilities for learning as is the case of eportfolios.

Survey results show certain incoherence among student answers. In general questions, students answer with the options that indicate higher levels of positive attitude towards the introduction of mobile technology in education and in eportfolio processes. However, when asked about their real usage of mobile technology or for the concrete processes empowered, the answers are not so fully positive. The findings show a greater use of mobile technology collaboration and the creation of artefacts, which are also the processes that students think are most highly empowered and that enhance their creativity. This fact allows us to conclude that collaboration and artefact creation could probably be the best way in which to foster the integration of mobile technology into portfolio processes in the initial steps, followed by processes such as documenting learning and reflection, which would be the one with lower impact (figure 1).

Figure **1**. mPortfolio processes mostly carried out by students

Further research is needed to confirm data obtained. It should be analysed if the nature of these processes mediated by technology is qualitatively different and how creativity is actually carried out. Also, future case studies could inform digital didactic designs (Jahnke & Kumar, 2014) in which collaboration could enhance challenges raised by school-university partnership (Herro, Qian & Jacques, 2016). Moreover, future research will be necessary to observe the improvement of students' perceptions after eportfolio implementations with greater scaffolding on the processes least empowered by mobile technology. These conclusions hold important implications for educational practice, and can help us in improving the introduction of mobile technology in the construction of eportfolios towards self-regulated aims. On the one hand, if an eportfolio project is aimed at improving social interaction, mobile devices should be included in the project design and implementation with the goal of enhancing it. On the other hand, if the eportfolio design is planned to foster reflection-in-action and documentation on the move, the conclusions allow us to think that better scaffolding and guidance should be given to students in order to make it successful. Finally, new research is needed to explore the perceptions of students on the enhancement of self-regulated learning processes through the implementation of an eportfolio design which integrates mobile technology in its core.

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