

THE GROUP E-PORTFOLIO TO IMPROVE TEACHING- LEARNING PROCESS AT UNIVERSITY

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This study analyzes the experiences with group electronic portfolios at the University Pablo de Olavide as a strategy of educational innovation to improve teaching-learning process at University. These experiences consist of the use of group e-portfolios inside and outside the classrooms, which were applied by the students to verify the achievements, difficulties, and most relevant evidence in the planning and implementation of a multimedia educational material (MEM) aimed at prevention and social awareness, with emphasis on social groups at risk and social vulnerability. The results, obtained by using a qualitative methodology, support that group e-portfolios improve the capacity of students to work collaboratively, enable an awareness of their own mistakes, facilitate their self-assessment, and provide evidence of their academic progress. Students consider the considerable time and effort needed to implement group e-portfolios as among the limitations of their use.

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1 Introduction

Teaching through information and communication technologies (ICT) requires a series of changes that generate a break from the traditional model but at the same time presents a challenge to the quality of university education (Aguaded, López-Meneses & Alonso, 2010). Also, students must acquire new skills for an adequate acquisition of knowledge, think critically, analyzing, synthesizing, making inferences, and the ability to solve new and complex social situations, communication skills, teamwork and reciprocity, characteristics of an in-depth learning approach (Barnett, Parry & Coate, 2001; Martín-Monje, Vázquez-Cano & Fernández, 2015). For these purposes, the potential of group e-portfolios (GEPs) for both students and professors have generated significant interest and investment by universities over the past seven years (Coffey & Ashford-Rowe, 2014) and as useful resources for a formative evaluation of students (Klenowski, Askew & Carnell, 2006; Chatham-Carpenter, Seawell & Raschig, 2010; Fernández-Márquez, Vázquez-Cano & López Meneses, 2016).

2 The Group e-portfolio

GEPs are a comprehensive collection of students' works that show their efforts, progress, results, and achievements in one or more areas over time (Paulson, Paulson & Meyer, 1991; Xu, 2003; Love, McKean & Gathercoal, 2004). In addition, GEPs have a major role in generating reflections on learning activities and giving value to the selection of evidence (Ellsworth, 2002; Klenowski, Askew & Carnell, 2006). In their review of perspectives on e-portfolios in Australian tertiary institutions, Hallam *et al.* (2010) indicated that e-portfolios are broadly acknowledged to have the potential to assist students to become reflective learners, leading staff to be more conscious of their strengths and weaknesses. Therefore, an e-portfolio can show the growth in the achievement of learning outcomes to measure what students have learned during a particular period of time (Tubaishat, 2015; Vázquez-Cano, Martín Monje & Fernández, 2014; López Meneses, Vázquez-Cano & Fernández Márquez, 2014; Vázquez-Cano & López Meneses, 2016).

In the present study, we used GEPs as a digital system that enables users to document competencies, events, and plans that are relevant to them in a school, college, or training context (Barbera, 2008; Vázquez-Cano, López-Meneses & Fernández, 2013). The GEPs are accessible, easy to view, and downloadable, allowing a cross-review and the construction and reconstruction of a hypermedia and evolutionary narrative of students' works (López-Meneses & Vázquez-Cano, 2013; Vázquez-Cano, Martín-Monje & Castrillo, 2016). According to Barrett (2006), the use of technology can motivate students to

use portfolios, especially if the process is engaging for the learners and gives them an opportunity to express their own voice and leave their mark in their portfolios.

GEPs have unique advantages over paper-based portfolios. First, learners can easily integrate multimedia materials into GEPs, allowing them to use various tools to show and develop understanding. This may be especially advantageous for at-risk children whose competencies may be better reflected through such authentic tasks. At the same time, by engaging these learners, their deficiencies in core competencies may be overcome. Second, e-portfolios are better in terms of cataloguing and organizing learning materials and illustrating the process of a learner's development. Finally, e-portfolios have different and numerous communication advantages. They are easy to share with peers, teachers, parents, and others, and they allow those involved to provide feedback through a single electronic container. Furthermore, the reflective nature of the portfolio has been shown to be its most important feature (Chen & Light, 2010; Joyes, Gray & Hartnell-Young, 2010; Vázquez-Cano, López Meneses & Sánchez-Serrano, 2015).

Similarly, different authors (Cambridge, 2010), have identified several advantages of e-portfolios in training, such as that e-portfolios facilitate the editing and incorporation of various multimedia materials. These are "interconnected documents" that allow links between portfolio elements, as well as with other external objects through hyperlinks, and the construction and reconstruction of a hypermedia narrative. The e-portfolios are "portable" and can provide a "rich picture" of the learning and skills of students. They can also involve students in the learning process and provide connections between academic and nonformal learning, as well as contribute to reflection and facilitate the assessment and evaluation of the students' learning. Finally, Vázquez-Cano et al. 2013 suggested that the potential of e-portfolios is a real revolution, a clear demonstration of the possibilities of e-learning throughout life, summarized in the motto: "E-portfolio for life."

In the present research, GEPs were used and applied to formal education. Each student used a single edublog, in which they included their own contributions and the group activity (<http://diariotrabajosocial.blogspot.com/>). The blog-publishing service Blogger (<https://www.blogger.com>) was used to implement the edublogs. Blogger is ranked 18th in the Listing 2.0 tools for learning outlined by the Center for Learning and Performance Technologies (C4LPT).

2.1 Context and objectives

This diachronic study originates from two teaching innovation projects

developed under a more general project on educational innovation and development at the University Pablo de Olavide (UPO, Seville, Spain), funded by the Department of Teaching and European Convergence of the University. The educational experience consists of a diachronic study on university experiences with GEPs done by students who have studied the subject “Information and Communications Technology in Social Education” within a first course of Social Education and a double degree in Social Education and Social Work. Both courses are taught at the Faculty of Social Sciences of the University Pablo de Olavide and were developed over six academic years from 2009-2010 to 2014-2015. The data include a total of 607 students (Table 1)

Table 1
SAMPLE

Studies/Academic Years	09-10	10-11	11-12	12-13	13-14	14-15	Total
Social Education Degree	79	39	42		77	68	305
Social Education and Social Work	7	35	57	58		74	302
Total	158	74	99	58	77	142	607

This study aims mainly to analyze the possible achievements, difficulties, and relevant evidence during the implementation of an educational multimedia group project (4 to 8 students per group) consisting of the design and development of a multimedia educational material (MEM) related to a social and educational problem selected by the students; the project implementation covers a period of six academic years (2009-2015).

From the academic year 2012-2013, the most significant GEPs were uploaded on YouTube and compiled on the web page <http://videosestudiantes.jimdo.com/videos-de-estudiantes-doble-grado-2012-13/>. The second activity consisted of collecting relevant evidence on the reflections, evolution, progress, and particular difficulties related to the implementation of the GEPs through comments (posts) uploaded on the subject edublog: <http://diariotrabajosocial.blogspot.com>. Subsequently, the professor of the subject developed a tracking system through e-mail and personal mentoring sessions for tutoring students on their e-portfolios. In the last posts/comments, students were asked to develop a self-assessment activity through a rubric on the functionality of e-portfolios. A rubric for the assessment of e-portfolios was created with four main categories: Main topic and contents (3 Points); Technical issues (2 Points); Portafolio development (3 Points) and Exposure of audiovisual material (2 points).

The assessment of the university activity accounted for 30% to 40% of the final subject grade, and this depended on the initial votes made by the students at the beginning of each academic year.

2.2 Method

This diachronic study was developed from a descriptive and qualitative method for studying a particular phenomenon over an extended period of time, therefore allowing the verification of changes that may occur and improving the learning process. The data used in this study include e-portfolios made by students during the academic year 2009-2010 to 2014-2015. All GEPs are published in the subject blog <http://diariotrabajosocial.blogspot.com.es/>.

The data were coded and analyzed with the use of the qualitative analysis software NVivo 10, which facilitates the development of instrumental coding phases and texts. This program also promotes transparency of the analytical process by allowing the researcher to search a particular text in a fast and more precise way (Flick, 2004). The research phases were: coding, categorization, interpretation, and inference (Miles & Huberman, 1994). After analyzing the data from the six academic years under study (2009 to 2015), a comparison of the data was carried out to confirm the stability of the results. The same node system was used in the different years; however, in the last academic year (2014-2015) a new sub-node under the category “group work planning” within the topic “teaching strategies” emerged, as did a new sub-node under the category “mentoring and monitoring” within the topic “introduction to job.”

Regarding the reduction process and the structure of the theoretical information phase, a process of encoding, categorization, interpretation, and inference (Miles & Huberman, 1994) was followed. In the data reduction phase, feedback on the various e-portfolios published in the subject blog (<http://diariotrabajosocial.blogspot.com>) was used. Subsequently, encoding was done by using the text format compatible with the NVivo program.

The first qualitative phase was analyzed with the participation of two coders who were instructed to independently unitize the MCMs’ text messages. After a first round of unitizing, inter-coder reliability-measures were calculated. We calculated Guetzkow’s U, which measures the reliability of the number of units identified by two independent coders, as follows (Holsti, 1969): $U = (O1 - O2) / (O1 + O2)$.

O1 represents the number of units identified by coder 1, and O2 the number of units identified by coder 2. After the first unitizing run, Guetzkow’s U equaled.0061, showing almost 95% conformance in the number of units identified by the coders. To check textual consistency of the identified units (Weingart *et al.*, 1990), inter-coder unitizing reliability was additionally calculated (compared electronically units of coder 1 and coder 2 using the Excel-program). In our case, textual consistency was as high as 82.12% in the first round, which is considered an excellent result (Simons, 1993). Using these main categories and the respective subcategories (total: 17 categories), the two

coders independently assigned a single code to each unit. After this first main coding round, we calculated Cohen’s kappa to check inter-coder reliability. The basic version of Cohen’s kappa suggested by Brennan and Prediger (1981) that we used is calculated as follows: $\kappa = (\sum P_{ii} - \sum P_i \times P_i) / (1 - \sum P_i \times P_i)$. We found a relatively middle-high coding correspondence of $\kappa = .83.11$ Kappa values above .80 are generally considered a very good result (Brett *et al.*, 1998).

2.3 Results

As a first general assessment, we present the numerical results obtained for each of the categories from the academic years under study (2009-2015) (Table 2). We can observe that the posts’ percentage comments was maintained throughout the study.

Table 2
NUMBER OF REFERENCES AND CATEGORIES

	Topics	Code	Number of References					
			09/10	10/11	11/12	12/13	13/14	14/15
Group Work	Personal Information	LEP	4	14	3	17	13	6
	Difficulties	DTG	24	24	35	7	2	15
	Planning and Distribution of tasks	PRT	52	24	21	25	13	76
	Topic election procedures	PET	20	7	19	7	3	10
	Workspaces	ETG	21	33	40	14	21	45
	Topics	TTG	18	20	18	9	14	17
	Sources	FTG	10	15	22	4	3	12
Portfolio Use	Advantages	VUP	8	8	12	9	10	23
	Disadvantages	IUP	7	7	10	7	10	19
Tutoring and teaching follow-up	Tutoring and teaching follow-up	TSG	36	19	6	10	8	11
Self-Assessment	Self-Assessment	ATG	8	12	21	14	14	25
Technical Aspects	Software	PI	7	12	2	3	1	9
	Technical Difficulties	DTT	19	22	11	15	16	32
	Media	TMA	8	12	2	3	1	4

Another category that showed continuity was “planning and division of work,” with an appearance of 52, 24, 21, 25, 13, 76 textual references. References to the “workspace” used during group work also appeared frequently throughout all the courses studied. Finally, categories related to the “pros” and “cons” and the technical difficulties of using the portfolio were also created

(Figure 1).

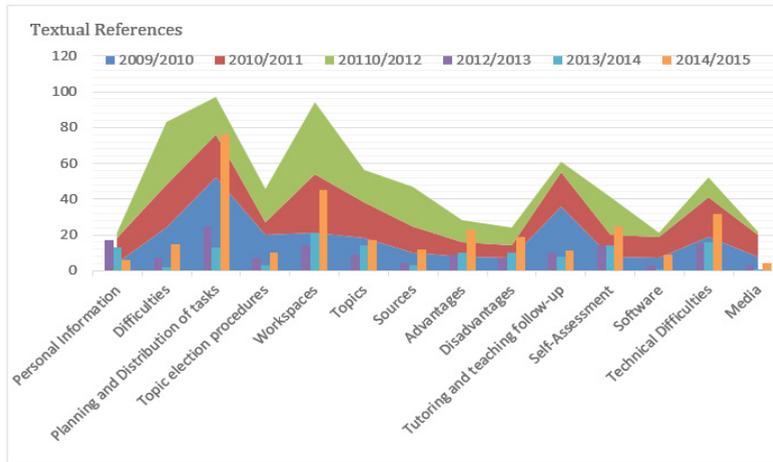


Fig. 1 - Topics comparative analysis.

In general, we can assess the importance of each of the categories in this research in terms of total percentage of appearance throughout the six college years studied, as shown in Figure 2.

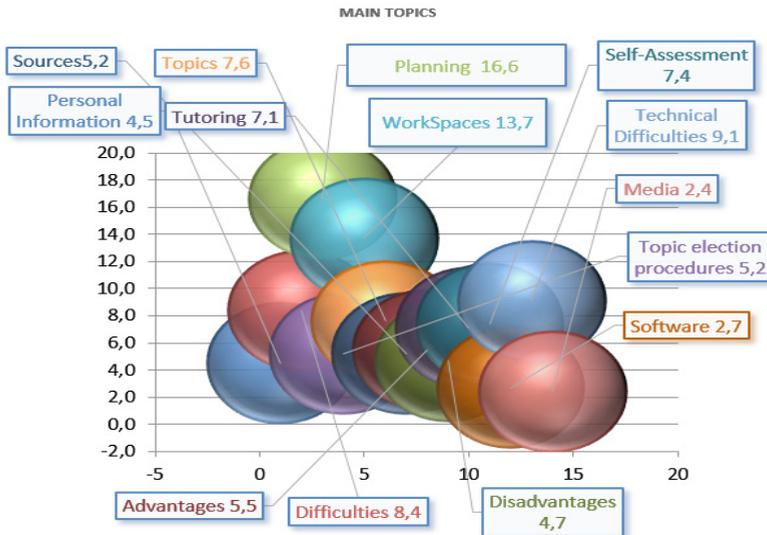


Fig. 2 - Main topics. 2009-2015.

Based on the figure, the highest percentage of textual references (17% of the total references) focused on describing the planning process followed throughout the MEM project. This topic is followed by comments on the spaces used for the development of group sessions (14%) and the different technical difficulties encountered (9%). Students also cited difficulties in working collaboratively (8%). Finally, 7% of the references focused on describing the mentoring processes carried out by the teacher and the description of the process of self-assessment in the group. We then evaluated the comments in each of the categories and subcategories.

It should be noted that the teachers' intention was to create a connective and constructive assessment culture from a discursive perspective in line with O'Keeffe and Donnelly (2013), who showed that students could regard the assessment as a positive experience toward learning rather than as a punishment. To conclude this analysis, another node referred to the "pros and cons" in using this methodology. This category is compulsory because it forms part of the last task to be included in the group portfolio (Table 3).

Table 3
NODE CODIFICATION: "ADVANTAGES AND DISADVANTAGES"

	Node: Advantages	Node: Disadvantages
Document 2009/2010_1	e-Portfolio allows us a better planning of the work and it facilitates our improvement process, allowing us to be aware of mistakes and correct them in time.	Sometimes the development of portfolios is slow and you need to dedicate a lot of time.
Document 2010/2011_3	It promotes participation and responsibility of students to assess their own learning. It is a good method of organization and promotes self-learning. It helps to certify student's competence, basing the assessment in authentic work.	The generalization of the results is limited although they are inappropriate for measuring the level of knowledge of facts. We think it is appropriate to be used in combination with other traditional assessments.
Document 2014/2015_8	To write in the portfolio has been very useful to establish a clear sequence of work. Finally, it is very positive to see others comments in order to get a general overview of the activity.	You need sometimes to be very concise to record all the activities done during portfolio implementation.

According to the comments made by the participants, it can be inferred that the advantages of the methodology are that it improves the group work planning, allows students to know previously reported mistakes, and facilitates self-assessment and control of learning. The main limitation of the technique, according to different authors (Barrett, 2000; Imhof & Picard, 2009) is the increased time and effort required to implement the digital portfolios.

Conclusions

One noteworthy conclusion of this study is that a transversal objective of the university experience, that is, “To encourage the involvement of students in their learning process,” was fully achieved, as evidenced by the work done by the students in their edublog (<http://diariotrabajosocial.blogspot.com.es/>). Another educational goal, “To know and use social software applications,” was also attained through most of the edublogs. In this sense, e-portfolios can be considered as an essential curriculum element toward professional development and as an aid toward the inclusion of emerging technologies in future social interventions (Lopez-Meneses, 2012). Also, the use of e-portfolios helps enhance the learning process related to the design, development, and evaluation of an educational multimedia object. In line with Hallam *et al.* (2010), e-portfolios have a great potential to help students become reflective learners. Although in this research some freshmen do not have a systemic and deep reflective exercise of their learning process.

It is important for students to be involved in the structural design of these processes to promote a more thoughtful and enriching evaluation. In this sense, Farmer, Yue, and Brooks (2008) indicated that hetero-assessment processes among students promote a more optimal and appropriate professional development in the European context. Regarding the university professors, in line with Jarauta and Bozu (2013), e-portfolios can be a valuable tool toward developing a reflective professional practice. In this sense, one of the most important aspects is that the teacher’s role in this activity can help to develop the learning process, the working methods of their classes, the tutoring processes, and the degree of acquisition of skills of students, as well as to minimize the possible difficulties of students when working in teams, among others.

In accordance with Iglesias (2013), the teachers can observe their students’ evolution with respect to the beginning of the learning period. Furthermore, students can state their perceptions and comments in relation to their motivation, the difficulties they encountered, and their doubts, strengths, weaknesses; in other words, they can reflect on their learning process and analyze it critically.

In short, as noted by Miller and Morgaine (2009), e-portfolios offer a rich resource for both students and teachers to express the achievements and results of their academic progress, establish meaningful relationships between different parts of the curriculum, and show evidence of the learning process, leading to the improvement and development of their identities as learners or as facilitators of learning. After six academic courses, it can be inferred that this reflexive methodological strategy provides a great educational potential for the improvement of university education, besides being a motivational tool for reflection on the educational process, allowing an intentional collection

of systemic evidence of learning (Aguaded, Lopez-Jaen & Meneses, 2013). Also, this strategy provides a more authentic form of learning assessment and a student-centric approach to learning (Orland-Barak, 2005). In this sense, e-portfolios can and should play an important role in the process of methodological innovation, assessment, and educational research (López-Fernández & Rodríguez-Illera, 2009; Aguaded, López-Meneses & Alonso, 2010).

Finally, we must address serious challenges to the implementation of this methodology, such as its incompatibility with many public university classrooms, which are often overcrowded and without the adequate technological and building conditions to develop this type of teaching strategy (Guasch, Guàrdia & Barbera, 2009). According to Hallam *et al.* (2010), for an optimal integration of e-portfolios in the academic context, a strong institutional commitment to provide strategic direction, greater involvement of the university community, and adequate funding are required.

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