IGI PUBLISHING
WWW.IGI-GLOBAL.COM

Table of Contents

RESEARCH ARTICLES

Factors Influencing E-Portfolio Use and Students' Approaches to Learning in Higher Education

Andrea Ximena Castaño Sánchez, Rovira i Virgili University, Tarragona, Spain

Ángel Pío González Soto, Rovira i Virgili University, Tarragona, Spain

José Miguel Jiménez González, Rovira i Virgili University, Tarragona, Spain

ABSTRACT

The aim of this study is to analyze the factors influencing eportfolio use in higher education and its implication on students' learning. These relationships are investigated under different stimulated conditions that have offered the potential for more understanding of the influencing factors in the investigated context. University students (N=56) attending the grades of Pedagogy (N=25) and Nursing (N=31) filled in two questionnaires at the end of the lesson of the course: The Revised SPQ-2F Study Process Questionnaire and AEQ Assessment Experience Questionnaire were used to measure the approaches to learning and perceptions of the assessment practice. First questionnaire was concerned the students' approaches towards their own learning. Second questionnaire covered general perceptions of assessment demands including the eportfolio assessment. The results showed positive relationship of the use of eportfolio activities with feedback, the training with eportfolios and the positive influence on student teachers' deep approaches to learning.

Keywords: Assessment, Competences, eportfolio, Feedback, Higher Education, Learning Approaches

INTRODUCTION

Today's higher education is looking for the development and implementation of teaching practices, learning environments and new modes of assessment that enable students to be better prepare to face the challenges of an emerging postmodern society. In order to reach these goals, learning should be in congruence with assessment (Segers, Dochy, Cascallar, 2003). It

is said, students' should demonstrate the skills to acquire their knowledge efficiently, think critically, analyse, synthesise and make inferences, the ability to solve novel and complex problems, communication skills, reciprocity and teamwork; characteristics of a deep study approach to learning (Barnett et al., 2001; Segers, Dochy, & Cascallar, 2003; Tynjälä, 1999). The concept of deep study approach implies that the student is driven by an intrinsic motivation to seek meaning and understanding and to integrate the different aspects of a task into a whole. By the other side, the concept of surface

approach to learning refers to develop a task without seeking for further connections, meaning or the implication of what is learned. In this case students tend to learn by memorizing and reproducing the content of the study material.

Complementary to the study of the approaches to learning, it has been demonstrated that the most contextual variables that influence students' approaches to learning is the assessment method (Scouller, 1998). Students turn their surface and deep approaches to learning to be able to cope with the assessment conditions of their lessons (Gijebels & Dochy 2006). Overall, it is claimed that the effects of the assessment on students' learning are mediated by the students' perceptions of these assessment demands. Some studies have presented empirical evidence for the relation between students' perceptions of assessment and their approaches to learning (e.g., Tiwari & Tang, 2003; Scouller 1998; Segers, Nijhuis & Gijselaers, 2006) and some other studies have shown that students who generally use surface approaches have great difficulty adapting to assessment requirements that favour deep study approaches (Martin & Ramsden, 1987; Marton & Säljö, 1976; Ramsden, 1984; Van Rossum & Schenk, 1984). Additionally, the nature of deep learning seen from the perspective of the student and the assessment demands are related with students' actions and decisions towards the activities and evaluation settled in form of explicit goals and its alignment with assessment. This can be described as the characteristics of the learning environment that can change a student learning approach whether it is done consciously or subconsciously according with the assessment demands that the student has been exposed. According, several studies (e.g., Kyndt, E. 2011; Kyndt, 2012; Gijbels, Cohertjens, and Vanthournout, 2009; Heikkila, Niemivirta, and Nieminen, 2011; Rosario, Nuñez, González, 2010; Baeten et al. 2010) have analysed students' approaches to learning towards deep meaningful learning in regards of different factors that can promote this kind of approach, some findings have pointed out the use of learning tasks that allow a true reciprocity of new forms of reasoning.

Consequently, the aim of this study is to describe students' learning by means of their approaches to learning and their experiences with conventional and non-conventional assessment. The latter applied through eportfolio using a strategy framed within characteristics of assessment including per-assessment, self-assessment, feedback, time and workload of task and reflection. The study have been developed around the fact that knowing how students can relate with their approach to learning and their assessment preference may offer insights about the quality of the learning experience they have been able to develop.

FRAMEWORK

Factors Influencing Approaches to Learning

The concept of approaches to learning has been studied under different conditions. One of the major concerns relies on the fact that the approaches to learning may vary depending on the characteristics of the learning environment, the type of designed instruction used with the students and the characteristics of the students. In this regard, Struyven, Dochy, Janssens, and Gielen (2006) have argued that students don't have constant characteristics. Instead, the relation between the learner and the environment determines them. Also, Wilson and Fowler (2005) evidenced that the characteristics of the students' approaches to learning vary according with the type of learning intervention; for instance, an action learning design can turn surface learners into deeper learners.

On the other hand, various researchers have analysed numerous factors influencing the way students perceive learning (e.g., Gijbels, Van de Watering, Dochy, & Van den Bossche, 2005). These factors have shown as encouraging or discouraging to the students' approaches to learning. The literature review study of (Baeten, Kyndt, Struyven, Dochy, 2010) has classified these factors as context-specific, perceived contextual factors and student factors. First, contextual factors consist of the characteristics

Table 1. Factors encouraging and/or discouraging approaches to learning (Baeten, 2010)

Factor	Description
Contextual factors	Teaching methods, emphasizing student centred environment, assessment strategies, feedback, subject/content/discipline, class/group characteristics, duration of intervention, time spent on student centered-teaching, reflection.
Perceived contextual factors	Perceptions of the workload of a student; perceive teaching quality, perceived supportiveness of the context (teacher support), the usefulness of the course book, learning outcomes, assessments preferences.
Student-factors	Age, gender, level of cognitive development, personality, social style, previous education, academic skills, learning habits, preferences for teaching methods, emotions, self-direction in learning, motivation, autonomy

of the educational environment that are related to the effectiveness of the approaches to learning. Some of them can discourage or encourage the approaches to learning. In general, some of the contextual factors widely investigated that have influenced the learning approaches have been related with assessment, feedback, time spend in student centred teaching, interactivity and discipline of study.

Secondly, perceived contextual factors refers on how students interpret instructional intervention having that this interpretation triggers the effects of the learning environment (Elen & Lowyck, 2000). These factors are related with workload; perceived teaching quality, perceived supportiveness of the context (teacher support). Thirdly, in relation to student-factors explained in terms of student-dependent nature of approaches to learning; many of these factors are related with the initial approach to learning, age, and gender, level of cognitive development, personality and previous education. *Table 1* describes in detail the categories and factors encouraging and/or discouraging approaches to learning.

Consequently, the present study focus in the perceived contextual factors of *assessment environment* and the contextual factors of *feedback, study-discipline, assessment methods* and the student factors of *gender and age*.

Conditions on Assessment for Learning

Research into student learning in higher education has reported a number of evidences about the influence of assessment on student learning. Gibbs and Simpson (2003) have studied the conditions within which assessment can foster learning. They have stated that assessment affect on what student focus their attention on, how much they study, on their quality of engagement with learning tasks, through feedback, on their understanding and future learning. The research of Gibbs and Simpson has brought eleven conditions for assessment to foster learning. These conditions were derived from a range of types of research, using a range of methodologies, in a range of contexts. The results were eleven conditions clustered under five headings (Table 2).

These conditions have concerned the factors of quantity and distribution of student effort; the examination and learning; quantity and timing of feedback; quality of feedback and students' response to feedback. The first condition is related with the amount of time demanded to students by the examinations allowing whether a student can pass without studying very much. Second condition is concerned about uniformity of effort throughout the lessons and topics of a course. Third condition refers to the kind of study approach that the assessment promotes and mostly about the students' perceptions of the demands of the examination. And, fourth condition is about the clarity and adequacy of

Table 2. Eleven conditions under which assessment supports student learning (Gibbs & Simpson, 2003)

Quantity and distribution of student effort
5. Assessment tasks capture sufficient student time and effort
6. The assessment tasks distribute student effort evenly across time and topics
The examination and learning
7. The tasks (revision process and/or exam) engage students in productive learning activity
8. Assessment communicates clear and high expectations to students
Quantity and timing of feedback
5. Feedback is sufficient, frequent and adequately detailed
6. The feedback is provided quickly enough to be useful
Quality of feedback
7. Feedback focuses on learning rather than marks
8. Feedback is linked to the purpose of the assignment and to criteria
9. Feedback is understandable by students
Student response to feedback
10. Feedback is received by students and attended to
11. Feedback is acted upon by students to improve their work or learning

learning objectives of a course and its alignment with the expectations of the students, so they know how much effort they have to put to reach the specified criteria. The conditions five to eleven are based on the influences of feedback on learning and they are based on the influence on how the feedback administered may improve significantly learning (Hattie & Timperley, 2007).

Also, the mentioned conditions for assessment have been tested by Gibbs & Dunbar-Goddet (2007) on the effects of programme assessment environments on student learning. It has shown the validity of the procedures of the study of Gibbs & Simpson (2003). They have tested the characteristics of various learning environments that could produce negative or positive learning responses related with the scales defined in their study. Which shows for example; low volume of summative assessment is associated with significantly higher scores on deep approach to learning. On the contrary, high volume of formative-only assessment is associated with significantly higher scores in deep approach to learning. Those are characteristics that provide insights on the quality of a learning environment and assessment system. They emphasised the use of formative assessment through oral and prompt feedback and the use of little summative assessment. Those are some of the characteristics associated with positive student learning responses.

This study have focused on students' learning approaches with two methods of assessment; eportfolio referred as non-conventional assessment and exams as conventional assessment. Additionally, it has been studied the differences in students' study approaches and assessment perceptions of students from the disciplines of Nursing and Pedagogy. The students have been stimulated under conditions of formative assessment and prompt feedback through eportfolio assessment.

METHODOLOGY

This study is in line with the necessity to validate eportfolio assessment in different disciplines (Baeten et al., 2010). We investigated the students' actual assessment preferences in a socio-constructivist learning environment; characterized by the use of digital educational application and assessment strategies of eportfolio combined with traditional assessment methods. We considered the encouraging and discouraging factors that may influence the

approaches to learning and the learning environment. Thus, the conditions of assessment and factors analysed consisted of time demand and student effort, feedback, study-discipline, and assessment preference (eportfolio/traditional). Three research questions were formulated:

1. How the encouraging/discouraging factors of the time demand and student effort, feedback and assessment preference (eportfolio/traditional) relate with students' approaches to learning?
2. How the dominant approach to learning influence the activities with eportfolios and the traditional assessment for the integrated sample?
3. How eportfolio assessment has influenced the approaches to learning in the disciplines of Teacher Education and Nursing?

Procedures and Instruments

We followed the recommendation given by Gibbs and Dunbar-Goddet (2007) to apply the AEQ questionnaire at the end of the assessment experience, in order to measure students' learning responses to different assessment methods. The application of both questionnaires R-SPQ-2F and AEQ was done at 80 percent of advancement of the course, where students have already participated of a four-month course.

Students filled in two questionnaires. First, perceptions of students towards learning were measured by Biggs, Kember & Leung's (2001) revised two-factor study process questionnaire (R-SPQ-2F) used to measure students study approaches. The R-SPQ-2F consists of 20 items rated on a Likert scale of 5. The questionnaire items are categorized according to two different approaches to learning; focus on deep and surface learning. Secondly, the Assessment Experience Questionnaire (AEQ) (Gibbs & Simpson, 2003) to measure the assessment preferences within the 11 conditions under which assessment best support their learning. It contains 35 items rated on six 5-point Likert scales according with the headings of the proposed conditions. The reliability of the source

questionnaires from Biggs et al. (2001) shows a CFI comparative fit index with a value of .992 and a SRMR value of .015 for a two-factor model at subscale level deep motive, deep strategy, surface motive, surface strategy. According with the recommendation by Hu and Bentley (1999), a CFI value greater than .95 and SRMR less than .08 is an indication of a relatively good fit between the hypothesised model and the observed data. In the applied instrument the scale "assessment and learning" referred to the activities in the eportafolio and the scale "examination" referred to the conventional assessment. Because of low alpha coefficients in the scale for "conventional assessment" the items 31 and 36 were eliminated.

Sample

In this study the participants were N=29 undergraduate students fourth year of Pedagogy, and N=26 students of second year of Nursing at the Rovira i Virgili University of Tarragona in Spain. The research took place during the academic courses of Pedagogy; Training Technology to the Teaching, fourth year N = 10, Professional contexts N =16 fourth year; and Nursing Pregnancy, Children and Adolescents in second year in Nursing N=29. The sample was chosen in an incidental way, that is not randomly since it aims to achieve contextual information (Gil Flores, Rodriguez Gomez & Garcia Jiménez., 1995) or opinion sampling method (Sabariego, 2009) or intentional to consider it a convenience sampling (Cohen & Manion, 1990). Students of the two programs were evaluated by two methods of combined formative and summative assessment with eportfolio and summative assessment through exams. There were 15 male and 40 females students, the average age was 23.

Settings of Learning and Assessment Environment

All Cronbach's α = 0.78 indicated a good overall reliability of the integrated questionnaire R-SPQ-2F and AEQ. Respectively, scale 7 deep approach (.80) and scale 8 surface approach

Table 3. Sample of the study

	Total (n=55)	Second Year Nursing Pregnancy, Children and Adolescents Nursing (n=29)	Fourth Year Teacher Education Pedagogy (n=26)
Male	15(27,8%)	8 (27,6%)	7(28%)
Female	40(72,2%)	21 (72,4%)	18(72%)
Mean age (std)	23,04	22,97	23,12

(.66) showed satisfactory levels of reliability higher than the internal reliability in the initial questionnaire of Gibbs and Simpson (2003).

The learning environment is based in socio-constructivist principle that emphasizes the active construction of meaning. We draw into the assumptions made from JISC (2011) about supporting learners to structure and restructure material for different purposes; feedback played a main role as supporting learners in reconstructing meaning and using feedback proactively. This approach required that learners reflected self-assessed and generated feedback on their own learning. Also, we assumed that learners can actively construct ideas from real life experiences. As part of the learning environment the assessment is a principal component by means of experimentation and reflection. The latter, based on the evidence that eportfolio appears very useful in learning environments in which instruction and evaluation form integrated parts (Struyven, Dochy, Jansens, 2003).

The learning environment supported in this study has had the influence of both teacher and student centred learning environment. Two types of assessment methods were used. Conventional assessment characterised by test-exams and oral presentations, and eportfolio assessment characterised by use of reflection, continuous feedback, collection of publication of learning evidences related with each of the learning goals. The learners can demonstrate by providing evidence that they have mastered a given set of learning objectives. We considered that the active creation process in preparing an eportfolio can avoid memorizing facts. Further-more, formative and summative assessment has been used as part of the activities with the ePortfolio and the exams. Also, the eportfolio assessment corresponded to a 40 percent of the total mark. Additionally, the formative assessment consisted of periodic feedback of their work and the periodic reflections on the activities and assignments on the eportfolio based on the model for reflection provided by Johnson, Mims-Cox, Doyle-Nichols (2006).

The eportfolio was introduced to students of pedagogy and nursing as an assessment strategy and a learning strategy as well. It has been emphasised the use of the eportfolio supported by digital artefacts that can improve the evidences of learning. The students have used the eportfolio platform implemented by the University on the open source platform Mahara, which provides the integration with the institutional learning management system Moodle. This integration of Mahara and Moodle allows the integration of continuous formative and summative assessment. The last part of the evaluation consisted of a self-assessment that each student performed based on the evidences collected during the course according to explicit criteria and individual self-reflection on the learning process.

Additionally, one principal component of the assessment was the initial training with the eportfolio, as a formative and digital tool. The assessment strategy proposed in this study was explained to students in pedagogy during the second lesson. Also, samples of eportfolios were showed beforehand. Thus, the formative assessment with eportfolio consisted of self-

reflection, a try-out initial sessions comprised of (in) formative directions from the teacher. Although the students in Nursing didn't have the same initial training with the digital application Mahara and eportfolio strategy, they were using the eportfolio tool along with the requirements of the course. Additionally, the eportfolio was introduced as process and a product. However, we emphasized the process of documenting learning through evidences for the tasks that were going to be evaluated in the eportfolio and those activities that were related with the learning goals of every signature. Laurillad (2012) have proposed a pedagogical design based on intended aims, learning outcomes and curriculum topics. We have assumed that students' perception of the eportfolio was influenced by how they conceptualize it as a process and product based on Struyven, et al. (2006) suggestion. Also, we assumed that for more students, the digital learning environment based on socio-constructivist principles, student-centred teaching approach was a new experience.

The instructional approach covered with the students for both disciplines pedagogy and nursing was based on socio-constructivist principles. This implies that student construct knowledge on the basis of authentic projects. Lectures consisted on the explanation of the topics to be covered by the study plan and its application within the domain of study. Students in Teacher Education were in fourth year and the last of their careers, they used the eportfolio with the purpose of its future application in their professional practice. In their case, eportfolio consisted of evidences of each assessment activity related with the learning goals of the study plan. Also, for the students in pedagogy sets of five activities related with each learning goal from the study plan were evidenced in the digital eportfolio. The students of Nursing followed an instructional teaching characterized by lectures, practical work, and reflections of their own work.

Also, the instructional process took place based on the conversational framework based primarily on feedback. Laurillard (2012) have

described it as feedback loops between learning activities and teaching activities. So, the teaching and learning process turns iterative and the prompt feedback over the digital evidences have represented most of the formative assessment. Furthermore, the conversational framework emerged as an attempt to merged conventional and digital teaching methods that can be used to best support student learning. The learning process is designed to take the form of a set of iterative cycles of interaction within the learner and between the learner and the teacher and the external environment. Also, in order for feedback from assessment to lead to a deep learning approach, assessment needs to be embedded in a constructivist or network learning environment (López Fernández, 2008; Segers, Gijbels, & Thurlings, 2008)

The teacher acts as a facilitator guiding the active learning through a set of guidelines. Aligning teacher-learner goals; setting tasks that use concepts and actions; clarify the structure of concepts to assist the organisation of knowledge. Also, construct an appropriate practice environment; monitor learner actions and articulations of their concepts; ensure meaningful feedback. In relation to the abovementioned aspects of the pedagogical design, the instructional method designed for the courses involved in this study emphasize the requirement to align the learners' goals with assessment requirements. Therefore, all the courses used experiential learning methods over more didactic approaches. The activities consisted on applying concepts taught during class through the lectures but also from experimentation and practice related with experiences of real life situations. Then the student was committed to reflect on the experience and observation made during the activities. For instance, some of the activities consisted of documenting the teaching practices made during their practicums.

Through various digital tools using videos, images, collecting teaching resources leaded by critical reflection on observation and experience. The students of nursing they were in their second academic year and their reflections were based on their first experiences with their

practices. In order to do the process of alignment of learner goals and assessment; learners needed to create actions that related their goals and the current concepts studied. Followed by feedback in which information was given about how to modulate their conceptual knowledge in order to improve the next action. Thus, it can modify their original goal; this has brought in to awareness that the intended learning outcome may not be achieved. We followed Laurillard (2012) suggestion making the learner able to understand the alignment between learning outcomes, teaching learning activities and assessment through the teacher's role as facilitator.

Data Analysis

The independent variables of assignment where coded into categorical variables. Assignment was coded 1 for pedagogy and 2 for nursing. Having the aim of this study is to identify difference between groups of pedagogy and nursing for the eportfolio use and traditional assessment preference and between groups of dominant approach to learning. We run test of normality Kolmogorov-Smirnov, and we applied the Wilcoxon signed-rank for the distributions that were not normal and t-student and correlations for the normal distributions. We also calculated the effect size using Cohen's d.

RESULTS

The means and standard deviations are presented for the different scales of the assessment preferences and approaches to learning (See Table 4). In relation to students' learning approaches, the results show that they employ deeper learning approaches than surface learning approaches. The quality of the feedback and the use student give to feedback are the most positively perceived aspects of the assessment practice. This implies that students have perceived the amount and distribution of effort and the quantity of feedback as the least positive aspect of the assessment practice.

Correlative Relationships

First question-concerned approaches to learning and its relation with each of the scales described for assessment to enhance learning; time demand and student effort, feedback and assessment preferences.

In order to explore these relationships Pearson correlation coefficients were calculated, see Table 5. Deep study approach correlated positive with amount and distribution of effort, quantity of feedback, the use of feedback and traditional assessment by the student. This indicated that students who in the time of study presented deep study approaches where using the feedback given and positively valued that feedback as useful for their learning and at the same time this implied that they value the time and effort used with feedback. In relation with the use of feedback by the students, those who adopted a deep approach to learning read the feedback carefully, as the total of prompt feedback was done through the eportfolio. This entailed that they were using that feedback to improve their eportfolios in the topics concerned there, as they were looking critically of the suggestions made by the professor.

On the other hand, students who have a deep approach to learning are aware of the time they use to cope with the academic requirements and they showed to value the use of feedback, since the prompted feedback was made with the eportfolio. It is representative that the way feedback is administered to students with the tool influences their perceptions of eportfolio; the latter has been evident with the strong correlation of eportfolio activities and the use of feedback.

Also, students who valued eportfolio also gave valued to the quality of feedback administered and the use given to these feedback but not favoured the quantity of time used for feedback. Then, a good quality of feedback can overcome the quantity of feedback given. Teachers can take this insight whose feedback can represent a lot of time but not necessarily is given accordingly with the necessities of the student. Consequently, students who valued the

Table 4. Mean, standard deviations per discipline

Scale	Teacher Education Pedagogy, Mean (Std) Total (n=26)	Nursing, Mean (Std) Total (n=29)
Amount and distribution of effort	2.58 (.49)	2.71 (.64)
Portfolio assessment and learning	3.73(.47)	3.26(.37)
Traditional assessment	3.44(.52)	3.62(.51)
Quantity and timing of feedback	3.25(.74)	2.81(.75)
The use of feedback by the student	3.77(.50)	3.63(.58)
Quality of feedback	3.57(.69)	3.21(.64)
Deep study approach	3.08(.51)	3.12(.58)
Surface study approach	2.33(.45)	2.38(.58)

quality of feedback also valued the amount of time and student effort implied in the assessment. Since, quantity of feedback and use of feedback have strong correlation students still relate these two characteristics of feedback.

Additionally, students value the quantity and quality of feedback given through their eportfolios. However, results didn't show high correlations about students' deep study approaches and eportfolio but with test-exams.

The results yielded a negative correlation between students' surface approaches to learning and their perceptions of quality of feedback, the use they give to the feedback and the amount and distribution of effort. These imply that quality of feedback and the subsequent use they give to feedback influence their approaches to learning towards deeper study approaches. Consequently, this validate the characteristics of students with surface approaches to learning when they don't spend time and effort on activities and don't have enough value of the quality of feedback and consequently the use they give to it. However, students with surface study approach still see traditional assessment as time consuming but also they put a lot of effort on them, consider them as important for their learning and associate it with their deep study approaches. Also, students with surface approaches to learning distribute their effort on assessment activities that can give them good grades besides their understanding.

The second question concerned the relationship of the dominant approach to learning and the activities with eportfolios and the traditional assessment.

Recio Saucedo (2004, p.99) proposes determining the intensity of the approach on the basis of the difference between the scores that a student obtains between deep and surface approach. So, the minimum score in each approach is 10 and the maximum 50. And, also the approach to learning can have 3 levels of intensity, low for a difference between scores of approach from 1 to 13, medium, if between 14 to 26, and high if it is between 27 and 40. With these precisions, the approaches to learning for the students of both disciplines reflected the following distribution Table 6 based on the dominant approach (approach with the highest score).

Predominantly we found deep approach students (48) versus surface approach (7). It can be observed the medium intensity levels on both approaches.

We based our analysis in the assumption that the distribution of the sample is not normal grouping by approach to learning, in the test of normality of Kolmogorov-Smirnov. The percentage for eportfolio activities $D(48)=.10$, $p>.05$, and traditional assessment $D(48)=.13$, $p<.05$ in deep approach to learning, and with low significance $p<.001$ in surface approach to learning.

Table 5. Correlations

	1	2	3	4	5	6	7	8
1.Amount and distribution of effort		0.16	0.17	0.40**	0.36**	0.12	0.34*	-0.42**
2.Portfolio assessment			0.24	0.49**	0.41**	0.48**	0.19	-0.10
3.Quantity and timing of feedback				0.25	0.43**	0.12	0.38**	-0.25
4.Quality of feedback					0.68*	0.08	0.23	-0.35**
5.The use of feedback by student						0.16	0.41**	-0.42**
6.Traditional assessment (test-exam)							0.40**	-0.22
7.Deep study approach								-0.26
8.Surface study approach								

*= significant on 0.005 level; **= significant en 0.01 level

The Wilcoxon signed-rank test compares two conditions when the same participants take part in each condition and the resulting data violate an assumption of the dependant t-test. In order to compare two related conditions eportfolio assessment and traditional assessment, both were applied on the same sample of participants; non-parametric Wilcoxon sign-rank test was run.

This analysis was executed because there were two set of scores to compare, deep study approaches and surface study approaches; and the distribution of scores was not normal. Students with dominant deep study approach, they valued more traditional assessment (Mean=3.61)(SD=.49) T=438.5, p > .05, and students with dominant surface study approach they valued more eportfolio (Mean=3.4)(SD=.34) T=3 (traditional assessment>eportfolio), p > .05. However, the difference is small in the preference of eportfolio and traditional assessment,

thus is not precise this method for comparing both conditions with the same participants.

Third question concerned the disciplines of Teacher Education and Nursing and its use of eportfolio assessment, traditional assessment and quality of feedback with the dominant deep approach to learning.

We based our analysis in the assumption that the distribution of the samples are normal grouping by discipline, in the test of normality of Kolmogorov-Smirnov, the percentage for Pedagogy in eportafolio D(22)=.18, p>.05, and nursing eportfolio, D(26)=.13, p>.05.

The percentage for Pedagogy in traditional assessment D(22)=.13, p>.05, and Nursing traditional assessment, D(26)=.15, p>.05.

The percentage for Pedagogy in quality of feedback D(22)=.15, p>.05, and nursing quality of feedback, D(26)=.13, p>.05.

In order to study the differences on eportfolio activities, traditional assessment and quality

Table 6. Distribution of the dominant learning approach

Learning Approaches	N. Students	%	Approach Intensity		
			High	Med.	Low
Deep	48	87.3	0	38	10
Surface	7	12.7	0	6	1

of feedback in both disciplines t-test was run over the data. On average, the students from pedagogy experienced the eportfolio activities more meaningful (M=3.7, SE=.47) than students from Nursing (M=3.2, SE=.37). t(47.36) = 4.06 (p < 0.01). And, it did represented a medium size effect r=0.5.

CONSLUSION AND DISCUSION

The reliability and validity of eportfolios in terms of assessment and learning, comprehend factors encouraging and discouraging learning. Aspects of the digital learning environment as well as the characteristics of the e-portfolio assessment in terms of allowing learners to adjust learning behaviours in order to improve them.

This research is in line with the study of (Segers et al., 2008) investigating students' assessment preferences and their approaches to learning. We analysed this topic according with the perceived contextual factors of assessment environment and the contextual factors of feedback, study-discipline, and assessment methods. The learning environment was characterised by constructivist principles infused with characteristics of the new paradigm of the assessment culture. In the practice the latter referred to as a shift from the so-called objective tests with item formats such as short answers, multiple-choice to the use of eporfolio assessment. It is a movement from low levels of competence towards high levels of competence and from reproduction of knowledge to assessing higher-order skills. In addition, students were influenced by both paradigms, when they were exposed to a traditional assessment and a non-traditional assessment with eportfolios.

According with the study of Gibbs and Simpson (2003) we investigated students' perceptions of assessment through the 11 conditions that can enhance student learning. First, the results of this study indicated that, students adopt deep approaches to learning when they learn in a learning environment that promotes formative assessment but the use of eportfolio as a means has not been proved. These conditions of quality of feedback, time and quantity of feedback, use of feedback proved to show results that seem to be in line with the studies of Higgins and Hartley (2002).

They indicated that perceptions of feedback are not driven by the final result but to recognise motivation through engaging students with their personal goals in a deep way. Feedback had a positive effect showing to promote deep learning approaches. The feedback showed that when it is used to add meaning on the concepts it promotes dialogue and understanding. It can imply a high time-effort for student and teacher but a meaningful learning where the student is capable to see an aggregated value when is implicated in a conversational cycle.

Also, the results indicate that students' perceptions of various aspects of the eportfolio assessment practice are related to their approaches to learning. On the other side, in respect to a deep approach to learning it added information about what students do with the feedback they receive, the amount of time used on working with the eportfolio and traditional assessment. We concluded that when working with eportfolios the time spend on feedback contributes to their deep approaches to learning than on the time spend on traditional assessment where feedback is given orally and in less quantity than prompt feedback. Also, this conclusion is in correspondence with Tiwari and Tang (2003) where students favoured eportfolio assessment for the process of preparing them and the meaningful feedback.

However, students didn't seem to favour eportfolio assessment, but in terms of their deep study approaches these were reinforced when working with eportfolio. Also, as concluded by Struyven et al (2006) instead eportfolio promoted a learning environment where feedback was meaningful.

Also, we identified that both forms of assessment influenced students' approaches to learning; conventional assessment in terms of summative evaluation and eportafolio in the formative evaluation.

ePortfolio assessment influenced deep approach to learning by the use of feedback which

was done in written form and in less quantity via oral communication. And, traditional assessment is influenced by the two study approaches in the amount and distribution of effort on the activities assessed. Additionally, it was found meaningful to validate this research in other assessment and learning context as suggested by Segers et al. (2008) and Gibbs and Simpson (2004).

There is an influence in this study about the practice in the educational activities. Firstly it indicates the influence of eportfolio and its important role of feedback, reorienting students learning by the cycle of constant dialogue between teacher and student. This was verified with the students' value of feedback perceiving it as stimulating their learning, motivating and easy to access through the eportfolio tool. Secondly, the results indicated the aspects of eportfolio assessment related with feedback and their approach to learning towards a more deep learning.

Also, the results showed relations of what students do with the feedback they received and how they perceived eportfolios assessment; how they use feedback and the quality of it and their perception of eportfolio as stimulating their learning. Although, the correlation of deep learning to eportfolio assessment was not significant, this results are equivalent to the interpreted results of Segers et al. (2006) showing that the influence of new modes of assessment does not always direct to fast changes in perceptions of the assessment demands and the adoption of deep learning approaches. On the contrary, it has been shown that students can maintain their learning approaches deep or surface besides changes in the assessment mode, but they can change instead their learning strategy. Thirdly, the results confirm the earlier research in the role of assessment and feedback in student learning. It is important as stated by Segers et al. (2008) that students collect continuous evidence of their competences in their eportfolios as an integrated part of their learning and to reflect on the extent to which they have acquired the competences.

One of the reasons why students from pedagogy related positively with eportfolio and students from nursing didn't might be caused by the differences of introducing eportfolio. Eportfolio assessment can support student learning when it is an integral part of the learning environment and it is communicated to, and discussed with students as a tool for learning. In this study pedagogy students where trained and informed about the benefits of eportfolios, they were clear about the learning goals to achieve with the eportfolio evidences and the criteria through they were going to be assessed.

In the study presented here, the eportfolio strategy was applied partially as summative assessment. We suggest practitioners of eportfolio, to evaluate them with a total summative assessment or total formative assessment, taking into account the possible influences in students learning. This way, research can be done on the influence of the eportfolio in students' achievement. In this regard comparing the students' study approach and assessment preferences can be more valuable after they already have full concentrated in this kind of assessment and can compare with their previous experiences with traditional assessment. Some of the limitations of the present study rely on the size of the sample and the way eportfolio assessment and traditional assessment was integrated in the instructional design. Students tended to prefer the assessment that represented higher score in the grade.

Additionally, suggestions from Struyven, et al. (2003) over other influences on students' approaches to learning besides their perceptions about assessment; there are psychological needs like the feeling of competence, autonomy, social relatedness and the need for satisfaction that deserve to be investigated in relation of this kind of study.

Complementary, future research should focus in other factors that influence eportfolio assessment and the approaches to learning regarding emotions, motivations, autonomy, digital competences and cognitive gains. Also, some further research may be done in a multidisciplinary field, combining the use of

eportfolios in several disciplines and longitudinal studies. Also, the use of e-portfolio and its implication on students' learning, regarding cognitive gains and the qualitative measures use in documenting students' though process. Finally, further research should be done on eportfolio application with different pedagogies and based on different learning theories and its impact on student outcomes.

REFERENCES

Baeten, M., Kyndt, E., Struyven, K., & Dochy, F. (2010). Using student-centred learning environments to stimulate deep approaches to learning: Factors encouraging or discouraging their effectiveness. *Educational Research*, *5*(3), 243.

Barnett, R., Parry, G., & Coate, K. (2001). Conceptualising curriculum change. *Teaching in Higher Education*, *6*(4), 435–449. doi:10.1080/13562510120078009

Biggs, J., Kember, D., & Leung, D. Y. P. (2001). The Revised two-factor study process questionnaire: R-SPQ-2F. *The British Journal of Educational Psychology*, *71*(1), 133–149. doi:10.1348/000709901158433 PMID:11307705

Boes, W., & Wante, D. (2001). *Portfolio: the story of a student teacher in development*. Katholieke Universiteit Leuven.

Cohen, L., Manion, L., & Casanova, M. A. (1990). *Métodos de investigación educativa*. La Muralla.

Elen, J., & Lowyck, J. (2000). Instructional metacognitive knowledge: A qualitative study on conceptions of freshmen about instruction. *Journal of Curriculum Studies*, *32*(3), 421–444. doi:10.1080/002202700182637

Flores, J. G., Gómez, G. R., & Jiménez, E. G. (1995). *Estadística básica aplicada a las ciencias de la educación*.

Gibbs, G., & Dunbar-Goddet, H. (2007). *The effects of programme assessment environments on student learning*. The Higher Education Academy.

Gibbs, G., & Simpson, C. (2003). *Measuring the response of students to assessment; the assessment Experience Questionnaire*. Open University.

Gijbels, D., Coertjens, L., Vanthournout, G., Struyf, E., & Petegem, P. V. (2009). Changing students' approaches to learning: A two-year study within a university teacher training course. *Educational Studies*, *35*(5), 503–513. doi:10.1080/03055690902879184

Gijbels, D., & Dochy, F. (2006). Students' assessment preferences and approaches to learning: Can formative assessment make a difference? *Educational Studies*, *32*(4), 399–409. doi:10.1080/03055690600850354

Gijbels, D., Van de Watering, G., Dochy, F., & Van den Bossche, P. (2005). The relationship between students' approaches to learning and the assessment of learning outcomes. *European Journal of Psychology of Education*, *20*(4), 327–341. doi:10.1007/BF03173560

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, *77*(1), 81–112. doi:10.3102/003465430298487

Heikkila, A., Niemivirta, M., Nieminen, J., & Lonka, K. (2011). Interrelations among university students' approaches to learning, regulation of learning, and cognitive and attributional strategies: A person oriented approach. *Higher Education*, *61*(5), 513–529. doi:10.1007/s10734-010-9346-2

Higgins, R., Hartley, P., & Skelton, A. (2002). The conscientious consumer: Reconsidering the role of assessment feedback in student learning. *Studies in Higher Education*, *27*(1), 53–64. doi:10.1080/03075070120099368

Johnson, R. S., Mims-Cox, J. S., & Doyle-Nichols, A. (2006). Developing portfolios in education: A guide to reflection, inquiry, and assessment. *Sage (Atlanta, Ga.)*.

Kyndt, E., Dochy, F., Stuyven, K., & Cascallar, E. (2011). The perception of workload and task complexity and its influence on students' approaches to learning a study in higher education.

Laurillard, D. (2012). *Teaching as a Design Science: Building Pedagogical Patterns for Learning and Technology*. ERIC.

López-Fernández, O. (2007). *El portafolio digital discente como metodología evaluativa innovadora. Estudio de caso multiple del comportamiento de los aprendices como gestores de su propio aprendizaje virtual en el contexto del Espacio Europeo de Educación Superior*. Universitat de Barcelona.

Martin, E., & Ramsden, P. (1987). Learning skills, or skill in learning? Marton, F., & Saljo, R. (1976). Approaches to learning. In F. Marton, D. Hounsell, & N. Entwistle (Eds.), *The experience of learning. Implications for teaching and studying in higher education. Edinmurgh: Scotish Academic Press, 2, 39*.

Rosario, P., Nuñez, J., González, J., Valle, A., Trigo, L., & Guimaraes, C. (2010). Enhancing self-regulation and approaches to learning in first-year college students: A narrative-based programme assessed in the Iberian Peninsula. *European Journal of Psychology of Education*, *25*(4), 411–428. doi:10.1007/s10212-010-0020-y

Sabariego Puig, M. (2009). El proceso de investigación (Parte I). In Metodología de la investigación educativa (pp. 89–120).

Scouller, K. (1998). The influence of assessment method on students' learning approaches: Multiple choice question examination versus assignment essay. *Higher Education*, *35*(4), 453–472. doi:10.1023/A:1003196224280

Segers, M., Gijbels, D., & Thurlings, M. (2008). The relationship between students' perceptions of portfolio assessment practice and their approaches to learning. *Educational Studies*, *34*(1), 35–44. doi:10.1080/03055690701785269

Segers, M., Nijhuis, J., & Gijselaers, W. (2006). Redesigning a learning and assessment environment: The influence on students' perceptions of assessment demands and their learning strategies. *Studies in Educational Evaluation*, *32*(3), 223–242. doi:10.1016/j.stueduc.2006.08.004

Struyven, K., Dochy, F., & Janssens, S. (2003). Students' perceptions about new modes of assessment in higher education: A review. In Optimising new modes of assessment: In search of qualities and standards (pp. 171–223). Springer.

Struyven, K., Dochy, F., Janssens, S., & Gielen, S. (2006). On the dynamics of students' approaches to learning: The effects of the teaching/learning environment. *Learning and Instruction*, *16*(4), 279–294. doi:10.1016/j.learninstruc.2006.07.001

Tiwari, A., & Tang, C. (2003). From process to outcome: The effect of portfolio assessment on student learning. *Nurse Education Today*, *23*(4), 269–277. doi:10.1016/S0260-6917(03)00012-1 PMID:12727094

Tynjälä, P. (1999). Towards expert knowledge? A comparison between a constructivist and a traditional learning environment in the university. *International Journal of Educational Research*, *31*(5), 357–442. doi:10.1016/S0883-0355(99)00012-9

van Rossum, E. J., & Schenk, S. M. (1984). The relationship between learning conception, study strategy and learning outcome. *The British Journal of Educational Psychology*, *54*(1), 73–83. doi:10.1111/j.2044-8279.1984.tb00846.x

Wilson, K., & Fowler, J. (2005). Assessing the impact of learning environments on students' approaches to learning: Comparing conventional and action learning designs. *Assessment & Evaluation in Higher Education*, *30*(1), 87–101. doi:10.1080/0260293042003251770

Andrea Ximena Castaño received her doctorate at Rovira i Virgili University with an emphasis in Technology Applied to Education and Knowledge Management. She has been a researcher and professor in subjects related with educational technology from 2008 to 20014 at Rovira I Virgili University. She has presented at international conferences on implementing learning eportfolios in higher education. Her research focuses in the areas of meaningful learning, technology applied to education, designing technology-based learning environments and innovation in Education through the use of educational technology. She is currently a Professor in the Technology Academy Center in La Sabana University.

Ángel Pío González Soto has been the head of the Institute of Educational Sciences at Rovira I Virgili University. He has a long career of more than 30 years as professor involved in many projects and expert in Education. He received his doctorate in Educational Sciences from Barcelona University in 1980. He is currently a Professor of Didactics and Educational Organization and researcher in methodology and scientific research in educational technology in the research group FORTE-ICE.

José Miguel Jiménez González is the head of the department of Pedagogy at Rovira I Virgili University. He received his doctorate in Educational Sciences. He has been involved in projects related with innovation in educational organizations. He is also a professor of Didactics and Educational Organization and researcher in methodology and scientific research in quality of education in the research group FORTE-ICE.