

E-PORTFOLIO: OPEN EDUCATIONAL RESOURCES FOR A NEW LEARNING CULTURE

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***Abstract:** The e-portfolio is an educational resource that has been increasingly implemented in the new learning culture. In order to improve this tool and observe its advantages and disadvantages together with the competences required to develop it, a qualitative study has been designed. This research has been conducted under the work package 4 “Selecting and testing IT tools” in the frame of the International IRNet project (Marie Curie Actions of the European Union’s Seventh Framework Programme FP7/2007-2013). From a qualitative approach, an open questionnaire was planned and validated to inquire students about the implementation of e-portfolios using wiki tools during the development of a class throughout their university studies at the University of Extremadura, Spain. Six dimensions related to the usefulness, difficulties, competences, assessment and potential improvements of e-portfolios emerged from the study. In this sense, this research determines the convenience of the tool with respect to applying knowledge to practice, promoting reflection and also managing information. However, it is indispensable to preclude difficulties regarding the lack of information together with potential technical problems that come up when first used. Finally, it has been detected that assessing e-portfolios with continuous and positive feedback not only motivates students but also makes them expand their skills..*

Keywords: E-learning, Computer Mediated Communication; Communications Networks; Communications tools; Educational Media, e-portfolios, reflection, assessment..

INTRODUCTION

The University of Extremadura is highly committed to the development of the ICT as a teaching and learning resource. This paper is part of research conducted under

the work package 4 “Selecting and testing IT tools” of the IRNet project (Marie Curie Actions of the European Union’s Seventh Framework Programme FP7/2007-2013). In this sense, the University of Extremadura is using the platform “Moodle v. 2.9” to support and improve the face-to-face learning. In order to analyse its execution, the tool has been implemented in a class in the field of Social Education. In this context, students were required to develop an e-portfolio, which displays and covers their learning progress. To design and generate the e-portfolio, a workshop on around “Moodle and the development of wikis and e-portfolios” was held. In this workshop, the objectives and elements of the e-portfolio were clarified. In this sense, the main objective of this study consisted in observing the constructive aspects and complications of implementing an e-portfolio, which were the necessary skills for its development and its possibilities in the assessment process.

This study aims to explore the utilization of e-portfolio as an educational learning/teaching tool by analyzing the difficulties that can emerge when using it as well as determining the required skills to develop it and its influence on ongoing assessment. According to Gutiérrez-Esteban & Mikiewicz (2012), who analysed the views of a sample of European youth about online learning, the benefits are given to studying formal education on this way. In addition, “the ideal pattern of online education offered by these participants includes formal and informal learning (official and non-official discourse, tools and methods, but they –both-work)” (p. 73). At the same time these new learning approaches (as for instance Personal Learning Environments) “*can be considered as a promising pedagogical approach for the deliberate or intentional integration of formal and informal learning spaces*” (Dabbagh & Kitsantas 2012, p. 4).

An e-portfolio is a purposeful collection of a student’s work that is made available on the World Wide Web, the cloud or an electronic storage device. It is similar to the traditional portfolio that consists of papers and folders; however, the medium this portfolio uses is different. In other words, it employs a combination of electronic media such as hypermedia programs, databases, spreadsheets, and word-processing software, as well as wikis or blogs. The electronic portfolio can be print-based, saved on an electronic device or cloud services, or a combination of the above. The information can take the shape of text, graphics, videos, sounds, images, or any other multimedia format. Following Banks (2004), an e-portfolio is an electronic format for learners to record their work, their achievements and their goals, to reflect on their learning and to share and be supported on this. It enables learners to represent the information in different presentations and brings such data with them as they move between institutions. It represents several concepts which have a particular resonance at the moment, for example: reflective journals; Weblogs or “Blogs” - and the shared version – Wikis; learning logs; personal development planning; learning centred on the individual learner and action planning for learning. Hence, an electronic portfolio is a collection of authentic and diverse evidence, drawn from a larger archive representing what a person or

organization has learned over time on which the person or institution has reflected and designed to represent one or more audiences for a particular rhetorical purpose (National Learning Infrastructure Initiative, 2003). As Keller (2013) states, an e-portfolio is an organized collection of professional work (artefacts), selected and reflected upon by the author that represents a person's best efforts. Over time, an e-portfolio will reflect professional changes and growth.

Since the early 1990s portfolio has renovated the educational world. Two tendencies in contemporary education underlie this phenomenon. The first is the rise of constructivism, a pedagogical school of thought that emphasizes learning by experience and self-discovery. Portfolio is a tool that is particularly well suited to these forms of learning. A second factor is the escalation of information and communication technology (ICT). Through ICT, assembling a collection or, in computer terms, the 'creation' of a database acquires possibilities, which until very recently were unimaginable (Meeus 2006). Pearl and Paulson (1994) outlined the differences between positivist portfolios and constructivist portfolios, but the two paradigms produce portfolio activities that are entirely different. The positivist approach places a premium on the selection of items that reflect outside standards and interests. Meanwhile, the constructivist approach places a premium on the selection of items that reflect learning from the student's perspective.

There are a few useful aspects, in the form of recommendations (Alonso & Blázquez, 2012) that should consider before developing a valuable e-portfolio. In this term, developing an e-portfolio: depends on the essence of the course (either an e-learning course or a blended learning one, type of contents to be included, different uses of the portfolio -assessment, reflection, accreditation, research, etc.); depends on the audience (their skills dealing with technology tools, their expectations and motivations, time they are supposed to spend creating their e-portfolio, etc.); also depends on the teacher (teaching their students of how to use this tool, his/her expectations and motivations, his/her own skills dealing with computers and e-portfolios, the feedback they give to their students, etc.) and finally depends on the software. Kahtani (1999) suggests that an e-portfolio should include: Students' work, peer response forms, teachers' comments and feedback, reading journals and miscellaneous. Agra, Gewerc & Montero (2002) emphasize that e-portfolios are a resource for the student and not for teachers, this should offer a meaningful structure and a reflective thread with different elements as: personal diary, objectives, reflections, questions related to the course development; attached documents, as exercises produced during the study of the subject, created by the students' initiative or by teachers' suggestions; reproductions of some material regarded as significant for the course, for example links and e-mails or chats that help students to reflect about the subject.

When students are required to develop their own e-portfolio, they face the challenge of achieving some skills. Such skills may vary depending on the type of e-portfolio they aim to create, but, overall, they include skills related to the e-portfolio itself, and some other associated to the portfolio's specific subject. When

Meeus (2004) studied the significance of portfolios in teachers' training, he highlighted that they serve teachers as an evaluation tool for assessment of the students' learning competence. Hence, the course tutor can determine from the learning portfolio if a student is able to: recognize educational competences that he/she lacks or has not sufficiently mastered; draw up an effective personal learning plan to bring these competences up to standard; carry out effectively; reflect independently and in sufficient depth on his/her educational practice; visualize his/her learning process in a creative way.

Constructing digital portfolios involves teacher's skills in the use of information and communication technologies (Kankaanranta, 2001). One of those skills are associated to communication skills by means of ICT, where it can be found at the following miscellaneous stages: being uncertain; developing competence; learning behaviour; becoming a more competent user; describing daily life at schools; discussing the content. Barrett (2006) emphasize that the skills connected to e-portfolios development are those that allow interaction between teachers and students around learning activities and products, so students can create, store artefacts and reflections and organize their work, preferably with hyperlinks, and teachers can review the work and provide feedback in narrative form (based on a rubric, if available).

Many are the useful utilities of an e-portfolio, but if one has to be selected, that could be its reflective capacity. Of course, depending on the structure designed for the e-portfolio, its reflective capacity can fluctuate. If a student wishes to use portfolio to show his/her competence, he/she must provide with an account of the activities in which this competence is demonstrated. In an educational context this means that the student draws up a personal learning plan (PLP) containing a series of activities with which the proposed competence can be practiced. In theory, each activity stimulates reflection. Here, the fundamental idea is that students need to learn to reflect on their functioning, so after completing the course they can continue to work on their own development in a conscious manner (Van Looy et al, 2000). These considerations reveal how the student perceives the difference between the actual and the desired situation. He or she can then adjust activities accordingly.

Brown (2004) has analyzed a course where e-portfolios were implemented. For him, an important concept built within the course was self-regulated learning using reflective writings for each artifact. Self-regulation as a method for achieving learning goals leads to an increase in motivation, self-monitoring, attention control, application of learning strategies, and other metacognitive thinking processes (Ormrod 1999). Following Barrett and Wilkerson (2004), the literature on traditional paper-based portfolios involves these portfolio development processes: Collecting, Selecting, Reflecting, Projecting and Celebrating. The infusion of technology into the process adds the following dimensions to this process: Archiving, Linking/Thinking, Storytelling, Planning and Publishing. To effectively use portfolios for assessment, a learning organization needs to establish a culture of

evidence. Evidence in an electronic portfolio is not only the artefacts that a learner places there; to be considered evidence of learning, the artefacts need to be accompanied by the learner's rationale, or their argument as to why these artefacts constitute evidence of achieving specific goals, outcomes or standards. Furthermore, just because a learner makes the claim that their artefacts are evidence of achievement, in "high stakes" environments, the evidence needs to be validated by a trained evaluator, using a well-developed rubric with identifiable and specific criteria. In this sense, Jones, Downs & Jenkison (2013) even state that e-portfolios are useful tools to make students aware of the effects of transparency on the e-portfolio creation process.

In the case of Chan, Lian, Shu & Tsai (2015) the key successful factors (called KSFs) of knowledge management for university students using e-portfolio were established in this study based on the Fuzzy Delphi method (FDM) and Fuzzy Analytic Hierarchy Process (FAHP) according to a group of experts' valuations. Hence, the KSFs of Knowledge Management using e-portfolio founded were Knowledge Sharing, Innovation, Acquisition, Application, and Accumulation. But also, other detailed sub-KSFs were developed based on the activities of the e-portfolios that covered Reflection, Work Revision, Self-assessment on works, Arrangement of learning content, Teacher Feedback, Modeling, Communication and Discussion. The most valued sub-KSFs (the highest weight granted by scholars) were Reflection underline by these authors to have the greatest impact on Knowledge Management.

As confirmed by Mohamad, Embi & Nordin (2015) -based on their findings- the learner's readiness in e-portfolios involved Technology Accessibility, Online Skills and Relationship, Motivation, Internet Discussion and Importance to Success. Nevertheless, they also conclude the necessity of precise skills when using the e-portfolio such as Collecting, Managing, Grading, Recalling and Reflecting. Additionally, the benefits offered, mainly regarding the increase of investment, are responsibility and engagement of students in their own learning process and the trend to show "a better holistic picture of student's understanding" (p. 272).

In the same way, McKenna, Baxter & Hainey (2016) designed criteria for evaluating learning tools in e-learning, specifically to assess the usability of LMS e-portfolios in Higher Education. Their study was developed on the basis of a systematic search of academic literature review and the LMSEC questionnaire (Learning Management System Evaluation Criteria) created to assess the quality of LMS e-portfolios, which includes some categories as indicated below: General information given to learners prior to commencement of course, Accessibility of course material, Course organization, Language, Layout, Course goals and objectives, Course content, Learning Strategies for Opportunities for Practice and Transfer, Learning Resources and Assessment.

Matar (2015) identified six different e-portfolio systems suitable for educational purposes. Additionally, he set the criteria for distinctions that will introduce the

most appropriate e-portfolio system within an educational context. These criteria are Curriculum related features, Career Opportunities, Assessment, Publish/Share, Analysis Tool, Access, Customization, Technical Information, Staffing requirements and Costs.

Regarding the teaching portfolio, Bozu & Imbernón (2012) believe this instrument has a training flank helpful to enhance teacher's professional development. It is considered a "valuable tool" (p. 238) as well as a resource that favors reflection on individual teaching and methodology. In this sense, this tool provides users with some other compensation:

- Teaching/learning instrument
- Reflective tool on teaching methods
- Tool to enhance quality teaching
- Informative device that collects data on university teaching
- Professional growth tool
- Professional career
- Tool that helps to appreciate teaching professionals

At the same time, San Jose (2015), conducted a study about the use of e-portfolio in e-learning platforms for pre-service teachers' training. He emphasized two main components when analyzing pre-service teachers' answers: students' experiential feedback of the technology platforms being utilized in teacher education programs (component 1) and evaluate the technical features of the e-portfolio technological platforms (component 2). Moreover, according to Cortes Peña, Pinto Santos & Atrio (2015) university teaching staff values as positive the fact that e-portfolio covers some of the following topics: e-portfolio design and content, ICT standards development, students' achievements (self-evaluation) and self-pedagogical building. Besides, they conclude that students' appreciation of the teaching tool possibilities is crucial; students that are aware of its implementation aims are familiar with evaluation criteria. Together with the management of the platform, they consider positive the advantages to develop critical analysis and the reflection on teaching practice.

METHODOLOGY

This study has been designed from a qualitative perspective. The instrument employed was an open questionnaire created ad hoc for this research. The different dimensions and questions included in the questionnaire emerged from a deep review of scientific literature of the field and the validation by five scholars who are experts in the areas of educational technology and evaluation.

- Usefulness of the e-portfolio

- Problems or difficulties found when using the portfolio
- Previous abilities and skills required to develop the e-portfolio
- Current abilities and skills useful to develop the e-portfolio
- E-portfolio as a resource to permanently assess students' work
- Potential improvement of the e-portfolio aimed at future courses

This questionnaire was distributed to all the students of the course through the online platform Moodle at the end of the course, once the assessment process had concluded. Finally, 33 students answered the open questionnaire.

ANALYSIS AND DISCUSSION

In order to provide this study with authority and accuracy, “content analysis techniques”, standard research techniques used in Social Sciences for non-structured or little structured information data were designed. An open questionnaire is a research tool where multiple different and open answers are obtained; this eases the richness and quality of the answers but complicates the analysis of the data.

Qualitative software was used to analyse the information. Firstly, the answers of the questionnaire were organized, and then codified and re-codified, so finally the main categories emerged in order to discuss the results. Those categories, their definitions and the percentage of the students that maintained each category are shown in the table and figures bellow (Table 1 and Figures 1, 2).

Table 1.

Categories and subcategories emerged.

DIMENSION	CATEGORY	DEFINITION	%
Usefulness of e-portfolios	Useful	E-P is useful in the training process	91%
	Non useful	E-P is not useful in the training process	9%
	Skills	E-P is useful to develop abilities	27%
	Opinion	E-P is useful to express opinions	27%
	Knowledge	E-P is useful to demonstrate the knowledge acquired in the face-to-face classes	36%
	Implication	E-P is useful as it requires the implication of the students	36%
	Manage of the information	E-P is useful to manage the information of the subject	55%
	Reflection	E-P is useful to promote reflection	64%

Difficulties of the e-portfolio	Accessing difficulties	Difficulties for not having computers and the Internet at home	18%
	Previous Knowledge diff.	Difficulties for not having knowledge or previous training enough	36%
	Time diff.	Difficulties for the lack of time	45%
	Technical diff.	Difficulties for having technical problems	55%
Required competences for using an e-portfolio	Reflection skills	Capacity of reflection is required	9%
	Self-organization skills	Capacity of self-organization is required	27%
	Technical skills	Capacity manage the ICT is required	100%
Competences developed by the e-Portfolio	Management Comp.	Competence of self-organization is developed	27%
	Technical Comp.	Competence to manage ICTs is developed	27%
	Reflection Comp.	Competence of reflection is developed	55%
E-Portfolio as an assessment tool	Assess if computer	Positive assess if having disposition of computer and the Internet	27%
	Assess if shows effort	Positive assess when it shows the continuous effort of the students	36%
	Assess if feedback	Positive assess when there is feedback of the teachers	36%
	Assess evolution	Positive assess as it shows the evolution of the students	45%
	Assess positive	Element of positive assess if “if computer” and “if feedback” are achieved	91%
Potential improvements of E-Portfolios	Improve feedback	Propose to improve the feedback of the teachers	18%
	Improve technical	Propose to improve the difficulties for using ICTs	18%
	Improve practices	Propose to do more practices with E-P	27%
	Improve initial training	Propose to do more initial training	36%

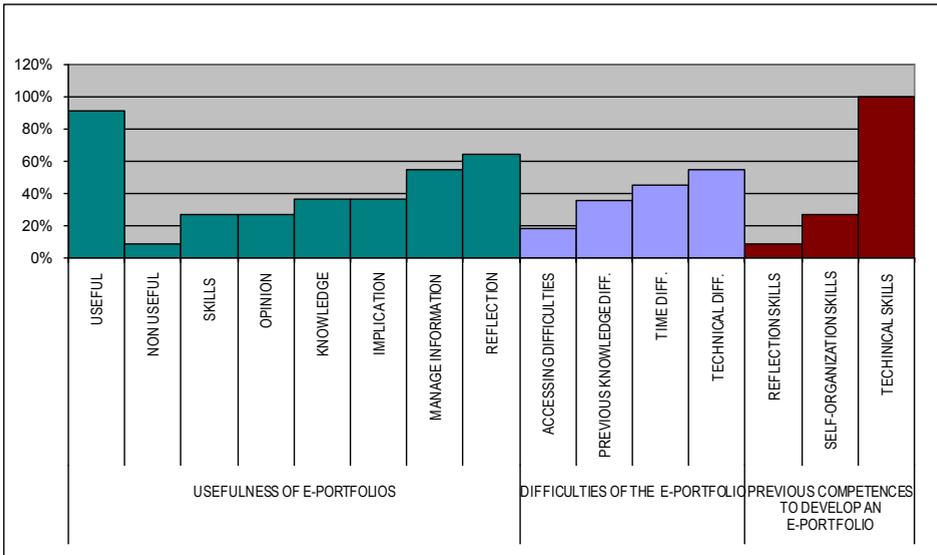


Figure 1. Results of the questionnaire. Dimensions 1,2 &3.

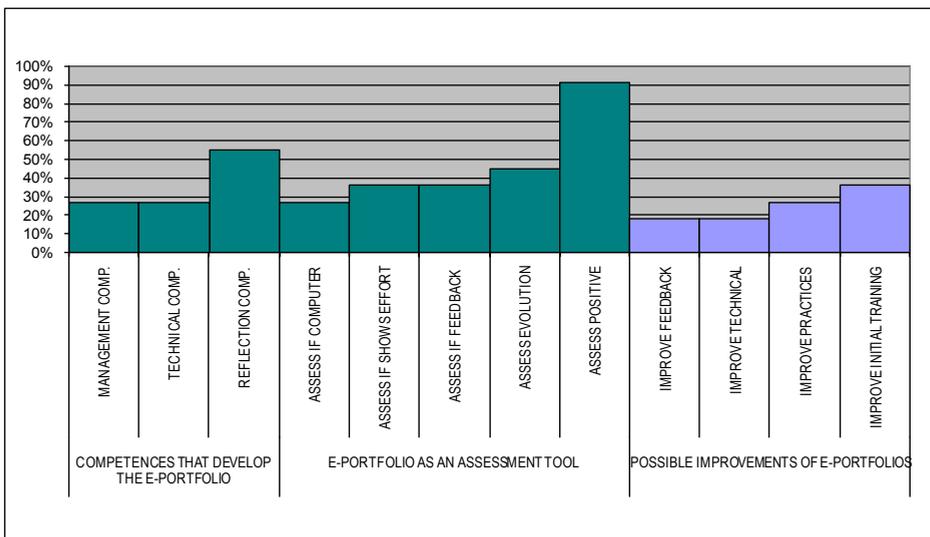


Figure 1. Results of the questionnaire. Dimensions 4, 5 & 6.

91% of the students maintained that the e-portfolio had been a useful tool for the learning process, nevertheless 9% of the students thought the opposite. Different reasons to consider this tool effective were given, i.e. its potential to generate reflection, sustained by the 64% of the subjects with comments like the following: “The e-portfolio has been useful because I have been able to reflect on the practice. This way of working helps me to think over; otherwise I wouldn’t have done it”. 55% of the students believed that the e-portfolio stimulated their ability to manage information though the learning process, as it implies not only to compile and

elaborate material related to the subject, but also to organize their personal time to reflect online. In this way, a student expressed: “The e-portfolio helps me to revise and practice what I learnt in the face-to-face class, furthermore it’s useful to access the information at any time”. (Registration No. 6, Female, 20 years)

For the 36% of the interviewees, this is a resource that allows applying knowledge acquired in the face-to-face lessons, promoting a higher implication of the students in the subject. The utility of the e-portfolio as a personal expression tool and to develop specific skills was sustained by the 27% of the students.

The difficulties or problems that the students had to face to create the e-portfolio were, in the 55% of the surveys, technical problems related to the platform and “to download or upload attached files”. Other kinds of difficulties that 45% of the interviewees found were the lack of time to elaborate the e-portfolio. One student said:

“For me the major problem was the lack of time due to the face-to-face lessons schedule, my personal circumstances and the extra tasks in other subjects, probably the sum of the all these”. (Registration No. 19, Female, 21 years).

The absence of some necessary previous knowledge to manage this tool was considered by 36%, although a practical and informative session was previously offered, some students maintained that it had been scarce “causing some opposition to use it”. Some others inquired about the possibility of accessing the computer lab more frequently, as they did not have Internet access at home. The overall of the interviewees highlighted that the competences or necessary skills required to develop an e-portfolio are technical, specifically “to manage computers and the Internet basically”. Additional types of necessary skills (27%) are related to the ability to organize the personal learning process; in this sense, a student maintained that this tool had helped him to be “a more organized person”.

The e-portfolios also facilitated students to develop some supplementary skills. 55% of the students remarked that their reflective capability had improved. Besides, this fact aided to increase their ability to utilize ICT, as well as the competence for personal organization in 27% of cases.

“It was necessary to organize and to plan the personal and the group work, the skill of analyzing and creating links with the items dealt in the face-to-face classes, with the previous knowledge and with the others’ opinions”. (Registration No. 27, Male, 20 years)

Assessing whether the e-portfolios is useful for the students’ assessment, 90% of the interviewees recognized its efficacy when some conditions are kept; those are the continuous guidance of the teacher (requested by 36%) and the possibility to access computers with Internet. A student stated:

“an e-portfolio is a great tool when it is used in the right way and whenever everybody has the same opportunities to get access to the Internet; if the teacher reviews the e-portfolio just at the end of the course, it is very difficult to assess if

the work of the student has been continuous, as he or she will do it just before being assessed". (Registration No. 44, Female, 21 years)

To this light, e-portfolio is useful to show the learning evolution of the students (45%) and the effort and on-going work.

The final question was related to the improvement of a number of features of the e-portfolio for forthcoming courses. 36% of the students detailed that there should be higher initial training to manage the e-portfolio, i.e.

"Perhaps explaining more extensively which are the objectives and what are the students supposed to do with this resource". (Registration No. 69, male, 20 years)

27% prefer more face-to-face practice in order to "prevent technical problems that are a waste of time and stress a lot". 18% of the interviewees asked for a higher feedback of the teacher and technical improvements related to the upload of attached files.

The development of an e-portfolio in a face-to-face course might be highly effective in the teaching/learning process. To conclude, some principal remarks about the findings of this study are shown below.

CONCLUSIONS

The main aim of this work was to study the usage of E-portfolios as learning/teaching tools within educational contexts by means of delving into the difficulties that can derive from its implementation, analyzing the required tools to use it and finally determining its influence in the on-going evaluation process. In order to present the main conclusions, some issues related to the studied dimensions were analyzed: usefulness of e-portfolios, difficulties of the e-portfolio, required skills for using an e-portfolio, skills developed by the e-portfolio, e-portfolio as an assessment tool & potential improvements of e-portfolios

In relation to the required and developed skills, we point out that previous knowledge required for the creation of e-portfolios is associated to diverse technical skills and students' management abilities. By using e-portfolios, our students developed reflexive, technical and management personal competences. In addition, for Gorbunovs, Kapenieks & Kudina (2013) the collaborative use of e-portfolio to develop tasks contributes to "succeed better learning outcomes and higher competence levels" (p. 6) together with engaging learners into group-working, critical thinking and reflection.

All in all, the aforementioned works coincide in highlighting some of the positive values of the e-portfolio to enhance the learning process such as critical attitude, self-learning reflection, self-teaching practice reflection, better learning outcomes, higher competences acquisition, assessment and the importance of collaborative working groups.

Its significant influence on a successful on-going assessment by means of monitoring and revising student's outcomes and allowing them to develop close approximations by modifying tasks that can be reoriented during the learning process has to be highlighted. To this end, wiki is a flexible resource since it can be easily edited by different people who are involved in the teaching/learning process despite the roles they have. In addition, this study has also established that it is a proper resource to assess and follow students' progress, whenever the teacher provides with constant feedback and the students manage tools to access Internet regularly. Hence, we agree with Mohamad, Embi & Nordin's (2015) thesis when stating that learning strategies and online instructional designs should face the challenge of increasing motivation and avoiding drop out and what is more significant, inactive students attitudes or low level activities are prevented when using e-portfolio (Gorbunovs, Kapenieks & Kudina 2013).

Finally, it can be concluded that e-portfolios are tools that can strengthen and enhance learning processes. However, their proper implementation requires highly engaged teachers that should get involved in the learning process and consider this tool a significant element for on-going assessment, accompaniment, guidance and facilitation of resources in order to achieve the established learning objectives. On the students' side, those able to enrich their learning by means of using it will additionally enhance their critical thinking, self-learning, autonomy and independence and reflection on their own educational learning process as well. They will be also able to create mechanisms to make their individual learning process more valuable.

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