

Assessment of research competences using e-portfolio

Elena Barberà

Mercedes Ahumada

Open University of Catalonia

Summary:

The challenges posed by the assessment of distance learning is a topic that requires, on the one hand, evolution with new trends and, on the other improving evaluative processes, to promote good practices. This demand becomes more imperative when we are dealing with a formative scenario based on distance assessment of competence-based learning.

The Open University of Catalonia has begun to work with these formative tools, promoting new practices for online education. A very clear example of these educational practices is the assessment of research competences using the e-portfolio system. To meet this aim a profound and solid process has been developed over recent years, with the intention of making this tool an assessment alternative, and providing the opportunity to use it in a formative context. The objective is to study its strengths and limitations keeping in mind the final goal of offering the higher education community a validated assessment system.

Keywords: e-portfolio, learning on-line, distance assessment, assessment of competences, met-cognition, good educational practice.

Introduction:

In the past decade the information society has brought with it new challenges that are generating transcendental changes on the international educational stage. An outstanding component of this, which enables us to materialise the transformation, is the inclusion of the electronic portfolio as a tool to support learning processes linked to personal development (professional, private, artistic, civil, etc.) and, of course, with even greater impetus, in the field of formal education, which is where we will focus our attention from now on.

The e-portfolio emerges as an instrument that enriches the teaching and learning processes, enabling a more profound approach to the types of knowledge the students develop in a given learning context. Many authors and studies argue that the electronic portfolio helps in the construction of knowledge, and promotes a critical and reflexive process in the students. This has overall repercussions for the richness of the learning experience (Cambridge and Williams, 1998; Bostock, 2000; Richards, 2005; Stevenson, 2006).

In the field of on-line learning, the use of an e-portfolio offers more effective pedagogic resources, as the technology generates processes that are extremely interesting for the construction of formal knowledge. Some of these processes relate to the ease of organising and meaningful storage of the student's documents and studies, as well as the capacity to interrelate them in a personalised manner, creating an idiosyncratic map of an individual student's learning. The presence of the e-portfolio presents the need to redefine important aspects such as the pedagogic concept applied to the formative process and the roles of teachers and students. This requires, among other things, the proposal of more

meaningful and pertinent evaluation practices, based on socio-constructive focuses for teaching and learning (Barberà, 2002; 2005)

Situated within this theoretical framework, we can say that all good educational practice requires shifting the focus of the educative process from the teacher to the student. In this way, responsibility and control are transferred to the student, creating a more meaningful involvement with the proposed aims. For Ash (2000), this increased student commitment, through evaluation experiences specifically based on the e-portfolio, is an essential component of their learning success. Without a doubt, it strengthens the development of new attitudes and practices in the students, and empowers them to successfully meet the academic challenges. Defined in this way, the proposed concept for using the e-portfolio in a formative context pivots around the met-cognitive processes of students' regulation of their own learning. The process of communicating their results online plays a key role in this concept, with the feedback provided by the teacher, and the use made of that feedback by the student reflected in the sequence of improved versions of the work.

This chapter aims to show some theoretical and practical elements of an experience that could potentially be considered current good educational practice, within the framework of assessment. The first section looks at conceptual aspects of the terminology, and at the contributions of the electronic portfolio as a system for formative assessment, by examining some of the principles that sustain it. In the second section, the e-portfolio is contextualised as a tool for supporting and monitoring learning in a university environment, defining its essential aspects and the phases that promote profound and high level learning. In the third part, the technical-pedagogical design of the electronic portfolio is explained, and we attempt to make clear the theoretical requirements we

have established, and finally, in the fourth section, the e-portfolio is introduced into a specific educational practice – research competences – which supposes the testing and practical of the e-portfolio as an assessment tool.

1. e-portfolio in education

1.1. Approaches to the concept of e-portfolio in education

In the commencement, the educational portfolio was only used so that students could display their work to a very restricted audience, generally just the professor and the tutor who had accompanied them in their learning process. The ultimate end, which is maintained today in many educational contexts, was to publish the progress of their work in these folders, and in this way give clear samples of their achievements. The portfolio as a strategy for assessment emerged in the 1980s when it was conceived as a tool to enable more effective assessment, and at the same time to transfer control and responsibilities to the students. From this perspective, for some authors, the use of the e-portfolio means the specific reconsideration of various aspects. For example, Barret (2005) shows that it implies determining, among other things, the pedagogic-philosophical field that underlies its conception, the nature of the aims that drive it, and the audience to which it is directed. The reconsideration of these elements, among the many aspects that must be considered, brings us to an inevitable terminological delimitation of what we understand by e-portfolio as an evaluation strategy with an eminently formative character.

In a more essential definition from an educational basis, as expressed by Barret and Carney (2005), the educational e-portfolio is the collection of

works and evidences chosen, reflected upon and presented by the students to support and show their progress in the learning process. Based on this premise the critical component of the educational e-portfolio is the student's own reflections about the tasks that have been proposed to show their degree of achievement and determine their learning.

The e-portfolio concept is directly linked to the work a student must do when faced with a set of objectives to reach or competences to develop. That is to say, the system should facilitate the clear demonstration of their progress when faced with specific challenges. However, the value of the system does not only reside in this. Perhaps more importantly, it should facilitate the guidance and educational support necessary for the student to really make progress at different levels. From this double perspective (of both publishing achievements and providing support for further progress) the electronic portfolio emerges with the intention of offering continuous learning support and the capacity to assume a number of different roles: favouring collaborative learning, promoting communication of the students' finished products, and facilitating the assessment of the results of the learning, among others. For Schneckenberg (2006) the practice of e-portfolio could be understood as a form of self-assessment of individual competences.

The electronic portfolio is a digital collection of the student's work, selected according to well-defined criteria, which facilitate a pertinent understanding of the efforts, progress and successes attained during a period of training or study. In this way, the electronic portfolio is a means to facilitate educative communication about what the student learns and how they learn it. While these elements may be shared with other evaluation methods, there is, nonetheless, an idiosyncratic aspect to the use of the e-portfolio that goes beyond common assessment

practices. This is the process of producing the evidence presented for assessment, as this demands that the student evaluate and justify the content that will be subject to assessment, accompanying it with the criteria that outline its inclusion, the reasoning behind the products shown, and evidence of their own self-reflection about the entire process.

The theoretical and practical bases that underlie the design of an e-portfolio for training purposes are geared towards promoting improvements in the students' learning. An essential part of its conception is the pertinent, pedagogic definition of its different aspects. In this sense, it is worth highlighting that it is up to the teacher to establish the central nuclei that make up an electronic portfolio, and for that he or she must have a very clear understanding of and support the final goals that drives the decision to work with this tool. From this perspective, some important considerations to keep in mind when producing an e-portfolio are (among others):

- The context into which it is being inserted
- The proposed aims
- The processes that the students should carry out
- The phases that will enlighten the products produced by the students
- The types of learning expected
- The type of feedback that will be contemplated

With this dynamic, the definition, planning and organisation of each of these aspects is a *sine qua non* condition for the successful development of the tool.

As is clearly shown, the e-portfolio demands that the student take responsibility for both the process and the resultant product. Not all

electronic portfolios can be understood from the perspective we are presenting here. This means it is necessary to introduce approximate classifications that, on the one hand allow us to situate ourselves within the basic typology of the different electronic portfolios that can be found, and on the other hand, avoid possible confusion in practice.

1.2. Typology of the educational e-portfolio

Producing a classification that includes all types of e-portfolio used in the field of education is no easy task, as it requires a collection of elements to be taken into account that help us to discern the uses and focuses of a given e-portfolio. The classification of an e-portfolio is currently determined by the final use that is made of it. So the nature of the evidences included within it allows us to categorize it under one or other e-portfolio type. There is a wide range of formal e-portfolio typologies, proposed by different authors (Siemens, 2004; Lorenzo and Ittelson, 2005). We include here the definitions proposed by Ash (2000) as it brings together and synthesises many other classifications.

- Instructional e-portfolio: aims to including the intermediary and final products of the teaching and learning assignments and processes carried out by both teacher and students, meeting a set of objectives for developing competences that must then be demonstrated. It generally promotes the capacity for reflection about the products included in the portfolio and allows the progress made to be exchanged with peers. It does not necessarily aim to carry out processes of assessment, as the principal focus consists of supporting the process of instruction, linking the students and providing the skills to accumulate evidence of a diverse nature, to complement the classroom experience.

- Professional development e-portfolio: this type of electronic portfolio allows the public demonstration of a set of professional skills, products and competences. The aim is simply to promote these aspects to a given public for a specific end, in this case, learning, accreditation and the expertise related to ongoing training and the professional career. The aim is to display the efforts and achievements of the e-portfolio's author at different levels, following personal criteria (similar to curriculum vitae, for example) or institutional criteria, if it is a specific job requirement (for promotion, assessment of performance, control of achievements, etc.)
- Assessment e-portfolio: this is a more precise tool with the aim of qualitatively and quantitatively evaluating the evidence of achievements presented by students, according to institutional accreditation requirements. This e-portfolio type includes, in broad strokes, accumulative e-portfolios that aim to evaluate a student's final products over an academic period and formative e-portfolios that are centred on the support and assessment of the learning process. We will look at this last example in more detail in the next section, as this chapter deals with the practice of this kind of assessment.

1.3. The e-portfolio for assessment

The electronic portfolio geared towards formative evaluation is one of the many alternative strategies for assessment learning progress in a given field. It implies the production on the part of the student of a series of works that are placed in the e-portfolio according to clearly defined criteria which later help in their evaluation. The flexibility facilitates progress in the student's academic efforts, to the point where the level of

expertise is such that the proposed objectives can be considered achieved and consolidated.

The experience of using the e-portfolio as an assessment tool supposes advocating authentic evaluation in which the process and results are linked in a specific context and promote achieving the academic aims (Mueller, 2005; Chang, 2005). From this perspective the practical application of the electronic portfolio as an assessment strategy opens the way for progressive improvements in the students' performance, as they receive meaningful feedback produced by the teacher in the light of their evidences and of the evaluation rubric that has been designed.

Implementing the electronic portfolio within the authentic evaluation model means that the teacher must prioritise, among other things, a continuous and formative evaluation, which enriches the student's learning.

Within this framework of action, the teacher's task grows and becomes more dynamic. He or she must conceptualise all the elements that make up the evaluation, define the criteria that will serve to evaluate the students' progress, design the evaluation rubric, establish the type of feedback he or she will give, and familiarise the students with all the production and assessment phases of their evidence. The teacher, as well as being a guide, becomes the facilitator of a genuinely authentic evaluation experience that is meaningful for the students. Some authors (Ahumada, 2005; Johnson, 2006; Nieveen & Dudink, 2006) emphasise that when the teacher acquires a strategic role that gives the assessment processes dynamism, they encourage the student to undertake critical reflection on his or her own processes and products. This leads to real learning improvements. It follows that this sort of teaching practice, managed by the teacher, leads to substantial improvements in the

learning achievements of the students as it effectively and actively involves them in the assessment process, thus making their academic and personal achievements more meaningful.

It is vital to clearly define the purpose of the process of evaluation through the e-portfolio (Stiggins, 2002). That is to say, we must be clear whether we *evaluate the learning* or focus on empowering the experience of the electronic portfolio as a strategy of *evaluating in order to learn*. The value of this second perspective lies in the fact that the students increase their learning as they prepare the evidence that will then be subject to assessment. The inclusion of reflexive processes is important here. The students must reflect on the product they will publish, and this allows them to sustain what they have learnt in a given phase. For Moritz and Christie (2005) this last point is the strategic axis, because if the student adequately applies their critical thought in the reflexive phases and in self-analysis of the process of producing the evidence, there is no doubt that this will produce an extremely meaningful learning process with real possibilities for success.

The practical application of the electronic portfolio also brings changes in terms of attitude that stimulate the effective involvement of the students and empowers them to continually evaluate their efforts. In this sense the formative e-portfolio facilitates met-cognitive processes in terms of the self-regulation of learning (Boekaerts, 1999) in which the student plans, develops, and strategically evaluates his or her own processes and learning products. Using this framework, the next section deals with the specific application of the e-portfolio as a strategy for evaluating learning based on competence in a university environment. In order to do this we will look at some essential aspects that will enable us to better understand what was carried out in practice.

2. e-portfolio as a tool to enhance deep learning of competences in the university context.

In today's educational environment, the e-portfolio is becoming increasingly widespread, and more and more faculty members are considering its use. The e-portfolio is already widely used within the framework of some disciplines, as a learning and assessment tool of competences. Its inclusion is progressive and has a variety of different purposes (Hartnell-Young, 2006). If we seek to encourage regular implementation of the e-portfolio, it is very important to deal with its conceptualization, internal structuring and competence concept as well. Assessment of competences is very use in the European framework these after years in higher education. The concept of competence is complex, dynamic and implied the combination and mobilisation of different kind of resources (Cattaneo & Boldrini, 2006) and combines knowledge, skills and action following sis progressive steps from information to professionalism (Ehlers, 2006).

We can agree that an assessment process implies the selection, collection, analysis, interpretation and use of the information that fosters decision-making, and we know that within a university context these decisions must be focused on learning and the development of professional competences in the students. The relationship between competence, learning and assessment is central to any possible scenario. It is therefore indispensable that the experiences of assessment meet two basic requirements, to the best of our capabilities: to assess competences, and to be beneficial on the learning process. Now we can advance our description of some of the reference points that help to clearly outline the university teaching context in which the evaluative practice of this e-portfolio is situated.

2.1. Aims and elements of the e-portfolio

The *raison d'être* of a formative e-portfolio at university is understood in terms of the identification of a certain deficit in terms of the student's continued implication in their own learning, as well as being understood in terms of the ever more complex management of information coming from different sources and promoting well balanced learning.

The presence of tools such as the e-portfolio in the university aims to achieve:

- a) Actively involving university students in the evaluation and continuous revision of their academic work. This demands self-evaluation of both the process and the product, often going beyond the academic year, and requires clear evaluation criteria that enable self-directed learning.
- b) Demonstrating the students' achievements through authentic tasks, in many cases chosen by the students themselves. This requires teachers to reflect on their practices and narrow the gap between teaching and learning through the assessment practices they promote.

In our specific case, these two aspects have been taken into consideration from the very beginnings of the project of assessment of learning based on competences, in a research environment, in a university context.

Without prejudicing other aspects that could be included, we considered (and later translated into practice) three main theoretical axes, on which rest the effort of turning the university educational needs into evaluation

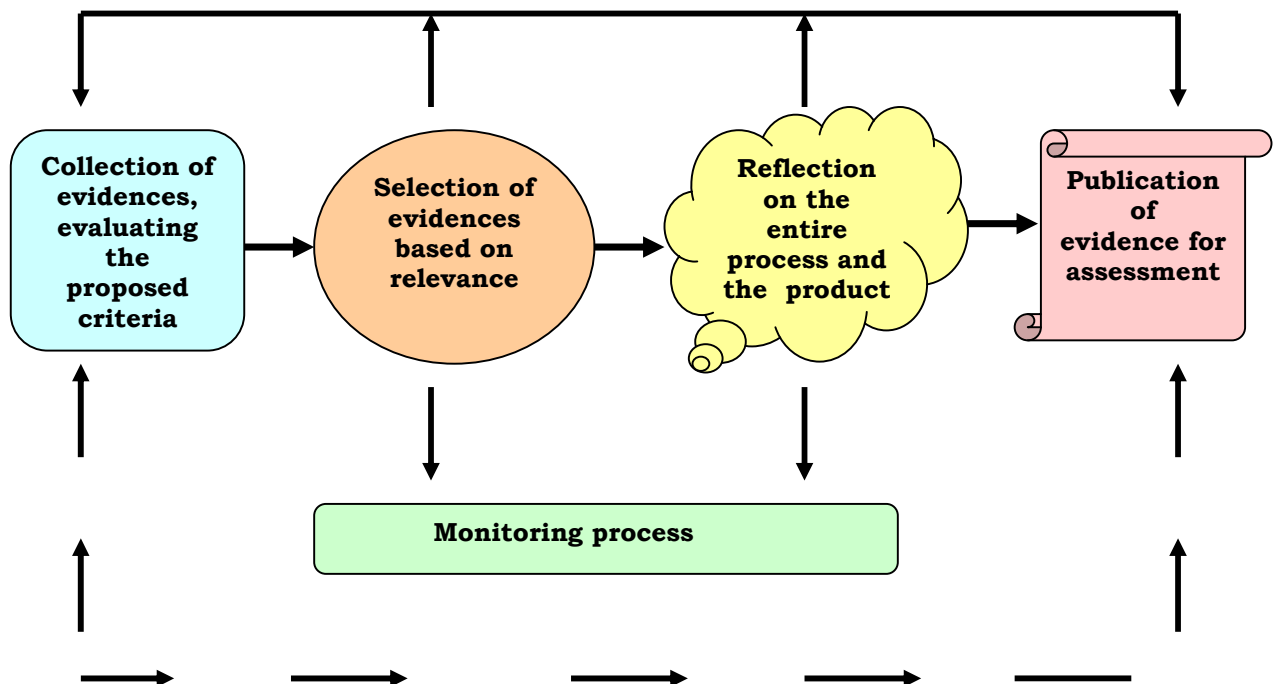
material and tools for the meaningful construction of knowledge. These three axes were briefly as follows:

- The *competences*: those capacities to be achieved on the part of the students, which are very closely related to the professional context. In this specific case, five research competences were developed and evaluated in a pilot test.
- The *evidences*: documents selected by the student, reflected upon and presented in the e-portfolio, keeping in mind some established and explicit criteria that show progress in the learning process, or the acquirement of a competence. It is important to mention that evidences may include different formats (written, audio, video) and that they are extracted from different contexts (academic, professional or everyday life).
- The *assessment criteria* described in a rubric understood as a matrix of the different levels of achievement and development, which enables the monitoring and assessment of the student.

Understanding how these elements of the e-portfolio develop leads us to a succinct display of the phases proposed by the students to carry out their e-portfolio work.

2.2. Phases

Among the different phases that should be contemplated in the developing an e-portfolio, it is possible to identify the following:



We will go on to present a brief description of the most important phases of the student’s work in carrying out an effort of this nature, the aim of which is to assessment learning progress.

- Collection of evidence. The collection of one or more pieces of evidence by the student requires a significant amount of time, to organise and plan the work or assignment requested by the teacher. In this sense, Ash (2000) shows the importance of opportune guidance from the teacher as to the products the student must prepare for later decisions about inclusion in the e-portfolio. She states that the criteria must be very specific, enlightening the planning process and structuring the collection evidence that the student will undertake, in such a way that the students are directly linked to the learning achievements they are trying to demonstrate.

- Selection of the most suitable evidence of the competences being worked on. This phase demands rigorous guidance from the teacher, which allows the students to apply criteria of quality and relevance to the selection of their evidence, taking into account the aims and competences that are the subject of the evaluation. In this case, the selected material should be directly related with the evaluation criteria used to evaluate the students' progress in a given area of learning.

- Reflection on the evidences chosen and the degree of relevance to the acquisition of the competence. It is a commonly accepted premise that there is a relationship between profound learning and a process of reflection on what has been learnt. Niguidula (1997) proposes the importance of developing a serious and fundamental reflexive process on the part of the students, about what they have produced and selected for inclusion in their e-portfolio. Carrying out this critical and reflexive practice will allow further optimisation of their efforts. Without a doubt, this is an essential phase in the development of the evidence. It requires the student to go back over his or her processes and products and carry out improvements that bring them closer to the proposed aims.

- Publication of the products in the individual e-portfolio accompanied by the elements that support the process. At this point, the most important element is the presence of sufficiently solid evidence linked to the proposed area of learning. The nature of that evidence can be very varied and will depend on the criteria previously established by the student and the teacher. The evidence may include (among other things) written documents, images, videos, audio recordings, conceptual maps etc. This final

phase provides the material required for a final evaluation of the student's achievements in terms of the competences proposed at the beginning of the process (Barberà et al., 2006).

All the previously mentioned aims and premises embodied in this chapter are based on a formative electronic portfolio, integrated into a virtual classroom, within the doctoral studies programme at the university. It was inserted into the framework of a specific programme of study, in the form of a pilot test.

3. The practice of e-portfolio

The Open University of Catalonia has been working on research that supports a competence-based learning assessment project using the e-portfolio within a completely online setting. Throughout the research process, efforts have been made, from a theoretical and practical point of view, to design and implement an e-portfolio within the university context.

This work aims to explain the experience of a term-long pilot test of the e-portfolio initiative in the aforementioned fully online university.

The study programme chosen was part of the doctorate on the Information and Knowledge Society, and the theme was the development of research competences in the educational field. More specifically the e-portfolio was used to evaluate research competences in a group of 27 students. From this perspective, the essential parts of the final e-portfolio are as follows:

3.1. Presentation

In this section the student, includes a recent photograph to allow him or her to be identified by the classmates and the course faculty. They then publish a slogan to express their philosophy, whether from a professional, or a more personal point of view. This section includes a presentation of the more essential personal characteristics to foster a more personal approach in his or her peers and the faculty.

To conclude this section, two more aspects should be completed: the outstanding works to be shown before the rest of the group and evidence of relevant work experience.

3.2. Competences

The course develops five research competences (explained in detail below). A definition of each of the competences, the models or examples of evidence proposed to orient the personal work, and the specific rubric for the assessment of the evidence were provided in this section. It is worth mentioning that each rubric was discussed with the students in a virtual workshop carried out before beginning the course, in an attempt to initially familiarize them with the tool and its fundamental components. We will speak briefly about this workshop later on.

3.3. Monitoring

In this section of the e-portfolio, it is possible to find the teacher's monitoring process that has taken place during the development of the course. In this space, every student's e-portfolio is included, providing access for the teacher to their publications of evidences of the competences worked on throughout the semester, and to opportunely

assess the process, or level of progress shown. It is important to emphasize that our goal was to develop the pilot test with the technological tools available at the university and that it has been implemented in the platform and within the training environment previously mentioned.

To adequately develop the e-portfolio pilot test, a virtual workshop was carried out in order to familiarize the students with two essential components: the tool and its operation, and the assessment of learning linked to competences, in this case for research. Before giving the workshop, a theoretical reader containing the conceptualization and purpose of the e-portfolio as tool for learning and assessment was distributed. The workshop took place over a 3-week period, the time in which one of the teachers successfully met the objectives initially established. It is also important to indicate that access to the virtual workshop for the students was maintained throughout the course to facilitate doubts or problem solving, whether by consulting the interventions of other classmates and the teacher in the workshop space, or sending a message directly to the consultant in charge.

A second element of central importance to this point is that during the virtual workshop the students received the instructions they needed to be familiarized with the tool and in more than one case we worked with some of them in synchronous modality to help them succeed in the tasks assigned. One of these assignments was to develop the opening section of the electronic portfolio of each student, for which the teacher designed her own, to be used as illustrative reference of the actions and product expected.

The e-portfolio's supporting platform is designed for general university teaching, taking into account all necessary aspects for its transfer to

other education centres or environments. In the present case, it was tested within the framework of a content, (professional and research competences) that is universal enough for its application to enable us to extract conclusions and challenges for future application, as you can see below.

4. Specific content of assessment: educational research competences

In the framework of the online classroom for teaching research competences, five forums were created, one for each competence. After the virtual workshop, the problem forums started, each with a general question. The intention was that students analyzed the information provided to identify the different components of the problem and display with clarity a fundamental resolution of the stated problem.

- Forum 1: **Problem**. The teacher presents a problem to be solved and the students have to collaboratively write a research question.
- Forum 2: **Hypothesis**. Students elaborate a preliminary and formal answer to the question with the help of the teacher.
- Forum 3: **Exploration**. Students search for articles and relevant documents to correctly support their final, individual answers.
- Forum 4: **Exchange**. Students exchange the documents and comments found in the exploration phase, through the virtual classroom.

- Forum 5: **Integration**. Students write a definitive answer to the question or problem, contrasting the hypothesis with relevant and shared documentation.

The forums were guided by a teacher with the aim of linking the students' learning experiences with the competence being worked on in the forum space. Each forum facilitated a direct and close monitoring process to foster the attainment of the goals and to clarify any doubts. It also provided the necessary feedback from both the teacher responsible for the forums and from the other classmates.

In the forums, there was also the opportunity for reflective discussion about issues related to the competence being worked on at that moment. At the end of each forum there was a global agreement phase among the participants with a view to future forums and allowing the group to move forward in the learning process.

It is interesting that the forums for "problem", "hypothesis" and "integration" were mostly carried out on individual basics, but collaborative processes took place in the "exploration" and "exchange" forums where participants must produce a common database based on the problem initially proposed and reach consensus by the end of the forum.

The students generated sufficient material in these forums to select a document as evidence of learning. The processes of revision and improvement of the versions of their evidence have led to self-regulated pieces of work, of a high enough level to demonstrate the development of the required research competences. The reflection and feedback process began with the students first contributions and formed a continuous backbone to the process.

When a student starts working with the e-portfolio he or she should have an adequate understanding of the task: what is expected, and the formal aspect of its delivery. They should also have the opportunity to propose it to the group of classmates and to exchange experiences.

This means:

- Having a clear definition of the competence to be evaluated and what was to be included in the e-portfolio.
- Explaining to the students the relevant types of possible evidence to be presented and the formality of their publication inside the electronic portfolio.
- Present the process and the tool to be used for the assessing the students' products: the rubric.
- Promote the exchange of products to improve and optimize their progress.
- Provide effective and pertinent feedback on the students' efforts.
- Indicate in advance that the evidence to be published responds to the structure requested and that the different accompanying components are included to facilitate a better understanding of the student's progress, including emphasis on:
 - *A comprehensive presentation* of the evidence published
 - The identification of the *content of the evidence* (video, audio, text written, image)
 - *Justification* of the importance of the evidence to support the degree of achievement in the competence being worked on.
 - *Met-cognitive reflection* about the learning process related to the competence. It is also recommended to develop a process of comprehensive and deep reflection, on the part of the

students. All the actions and met-cognitive reflections that are included should support and consolidate the evidence presented. (It would be a problem if efforts lacking comprehension of the process experienced by the student were submitted, given that evidence should be selected based on crucial issues, such as: why do you consider that this is the best evidence; how has this contributed to the learning proposed and to the attainment of a determined competence).

Summarizing these four elements is the core of evidence presentation, to provide feedback based on the specific rubric and other comments. These are explicitly included in a display page on the e-portfolio including communication tools. In other words, it is a matter of fostering met-cognitive questioning of the process as well as the product. Guide them to reflect on how they have developed the evidences with the requested components, the progress reached and the aspects remaining to complete the assigned task. Therefore, when providing feedback it should be a in the form of a qualitative contribution, depending on what the specific electronic portfolio allows.

The production of the evidence requires a process of substantial improvement of their product in the light of feedback from the teacher (there were various versions of a single piece of evidence, what have been optimised over time until reaching the final version). This qualitative and quantitative progress in their efforts towards a given competence and the improvement of their published evidence was an aspect that the students appreciated by the students as it increased their expectations and involvement in their learning success.

Conclusions

One of the first conclusions is that the students received the introduction of this sort of new evaluation focus very well. In our specific case, the practice of the formative e-portfolio supposes a direct benefit for the students in terms of monitoring (receiving high quality information about their learning process, strengths and limitations) and this brings with it a more profound and permanent work, inside an environment that can be more unstable if it is unknown.

A second conclusion that we reached is that the initial stage of the virtual workshop in this pilot experience was fundamental, because the students were prepared and familiarized with the approach and the procedure to work with the e-portfolio as well as the type of products expected as samples of progress in the mastering of the competences involved.

A third conclusion is linked to how the teachers of the course in this pilot experience should assess the complexity it encompasses and how time consuming it can be. We are facing an experience that is different from traditional forms of evaluation, and more so because in our case it was oriented towards the attainment of competences, which implies new roles for the students and the professors. We understand that the instructions provided to the students about what is expected from them are vital in this type of setting.

A fourth conclusion is that the feedback provided to the students was oriented to consolidate learning. They were therefore praised for their accomplishments and encouraged to reflect on what is yet to be achieved. Based on this premise, it is important to remember that we

were working according to the system of formative and continuous assessment. Consequently, the feedback was framed to promote values such institutional guidelines at the moment of the evaluation.

The final conclusion is that this pilot experience has improved understanding of the student's efforts, directly geared towards emphasizing an evaluation that promotes improvement of their learning. That is why we consider it essential to facilitate experiences and opportunities so that learning can be adequately consolidated.

We wish to make some proposals in the hope that this experience may be emulated. One of them is regarding the definition of guidelines and criteria of performance in advance on the part of the professor and the opportunity to reach an opportune consensus with the student. That is to say that both parties should know the terms on which the learning will take place, how the monitoring will be done, the type of accompaniment that will be given and which aspects will be emphasized by the professor in the development of the student's e-portfolio.

A second recommendation is geared to pointing out that we were in a virtual environment. The procedure for commenting on the progress therefore provided some examples that foster new challenges. The new ways of talking about those aspects still in process should be very clear so that the student understands what we intend to communicate.

We shouldn't forget that students always expect understanding of the work carried out and assessment that include qualification, the possibility for improvement and the opportunity to find new ways of optimizing the learning experience in an immediate future.

Emerging proposals

On carefully revising the points that we have developed in this chapter, and taking into account the contributions of the external evaluation carried out by Dr. Helen Barret, and the feedback from the users themselves (the students) we can see that some aspects require improvement or inclusion in future proposals of this nature. We will mention on only a few of these, with the aim of showing that there is still a lot to do in the field of teaching and learning processes using the electronic portfolio.

- In the field of university education there is an urgent need to examine the nature and purpose of learning and the processes of evaluation, taking into account that close links between the two processes. Re-examining these and other elements should happen in accordance with the current demands being made by society: incorporating the perspective of competences and the processes of evaluating the learning of said competences.
- It is vital to transfer an active and decisive role in the assessment process to the students. In this sense it is important that the student assumes the corresponding levels of responsibility for assessment of his or her learning throughout the training process: negotiating the criteria, evaluating time commitments and the quality of the work produced and the evidence selected.
- It remains to more clearly define the opportunities that come with evaluation experiences based on the e-portfolio in terms of the benefits of the tool which can help provide more immediate and relevant assessment experiences.

- It is necessary to invest in interoperable technological resources what enable the success of this type of learning evaluation experience, thus promoting meaningful improvements in the student's training experience.
- Given the nature of the implementation of the e-portfolio as an alternative strategy for evaluating learning progress, it is vital to reflect on the opportunity to integrate the experience within the formative curriculum of a given professional profile. That is to say that transversal conception and facilitates the registering of learning progress in the course of the study. In this way, we can avoid it becoming an isolated experience, lacking in meaning because it is not articulated, or conceived as structural or transversal part of their training.
- The feedback provided by the teacher, at both an individual and group level, should be a motivation and an effective opportunity to provoke participative discussion and learning for all the students participating in the experience.

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