EVALUATING CONTINUOUS ASSESSMENT QUALITY IN COMPETENCE-BASED EDUCATION ONLINE: THE CASE OF THE E-FOLIO

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Contextualization

Universidade Aberta, being a distance teaching university, is particularly suited to tackle some of the recommendations concerning the assurance of accessibility to education expressed in the "Education and Training 2010" goals (European Commission, 2008a). Meanwhile, the University's strategic plan for 2006/2010 decided to implement a fully virtual innovative teaching and learning methodology. The pedagogical model (Pereira, Quintas-Mendes, Morgado, Amante & Bidarra, 2007) adopted by the University is "strongly dominated by the valuing of students' social and communal integration, personalized monitoring of their learning and the respect for the particular life experience of each student" (p.8). This pedagogical model, in use since 2007, is based on four cornerstones: student-centered learning, flexibility, interaction and digital inclusion, aligned with the key competences required for learners in this knowledge-based society (Directorate for Education, Employment, Labour and Social Affairs, 2002). The cornerstone of digital inclusion is particularly important in the context of a fully virtual learning environment such as the one offered at Universidade Aberta. In this way, the University is promoting the development of competences in the use of information and communication technologies, especially in the case of adults who, even without having such ITC competences, want to enroll in a higher education institution. In this context, being a student at Universidade Aberta is a factor for social inclusion, contributing to digital literacy.

The dramatic changes that are taking place at the University call for close monitoring of its implementation and for applied research on online methodologies, which call for new open and distant learning assessment strategies. For this reason a new research unit was created at the University: the Distance Education Laboratory (LEaD – Laboratório de Educação a Distância). Some of the LEaD goals include: applied research focused on virtual pedagogies; the development and testing of pedagogical and technological innovative solutions; gathering, sharing, and disseminating knowledge in the area of e-learning; promotion of advanced professional development for course designers and e-tutors.

The implementation of the new pedagogical model forced, and at the same time called for, the use of new assessment strategies aligned with the most recent paradigm for assessment design in online learning (Birenbaum, 2003; Brown, Bull & Pendlebury, 1997; Mateo & Sangra, 2007). To implement this change it is necessary that all teachers become knowledgeable in these new alternative approaches to assessment in higher education (Maclellan, 2004).

The current research, being part of a larger project, is focused on assessment issues concerning undergraduate education. The discussed pedagogical model calls for two main types of instruments to be used in undergraduate fully online courses: e-folios and p-folios. The e-folio "is a short digital document elaborated by the student and published online to be visualized by the teacher, and should clearly demonstrate that the student acquired or developed a given competence" (Pereira, *et al.* 2007, p. 19). Here are some examples of what an e-folio may include: a critical reflection about the student's own learning; a report about field work; a problem solving activity; a reading review; or the production of an artifact. Being introduced as an instrument for continuous assessment of the competences promoted in a particular curricular unit, students are expected to produce two or three e-folios per semester. The e-folios may be complemented by a p-folio that takes place in a face-to-face setting. The p-folio may take the form of "a set of questions defined by the teacher, or other forms, such as the presentation of a project or a report, according to the competences to be developed by the students" (Pereira *et al.* 2007, p. 19).

The presented assessment model consists of a combination of different assessment methods, including alternative forms of assessment (the e-folio). In this way, we are promoting the development of a Competence Assessment Program (CAP) (Baartman, Bastiaens, Kirscgner and van der Vleuten, 2007). According to these

authors, "CAPs combine elements of the testing culture and the assessment culture. Newer forms of assessment are not regarded as alternative to traditional tests, but as complementary to them" (Baartman *et al.*, 2007, p. 117). Using just one assessment instrument is insufficient to make a clear judgment about one's competence. It is necessary to conceptualize the assessment of competences by taking into account that they represent a complex concept that includes knowledge, skills, aptitudes and values. Therefore, there is a clear need to develop a CAP including various assessment methods.

In order to implement this project it was fundamental to start by reflecting on the concept of competence to be adopted. The agreed, ongoing, construct for competence in use was based on the work of the DeSeCo project (Directorate for Education, Employment, Labour and Social Affairs, 2002) that presents competence as the capacity to successfully respond to individual, and societal, solicitations or to successfully perform a task or activity, requiring the mobilization of knowledge (both implicitly and explicitly), abilities, attitudes, emotions and values. At its highest level, this conceptualization of competence implies to choose and adapt from within the acquired processes those ones necessary to solve an unknown complex task or problem (Rey, Carette, DeFrance e Kahn, 2005). Based upon the group initial discussions, four main types of competences were considered for the e-folios analysis: problem solving; group work; metacognitive; and fluency in ITC use (Table 1).

Table 1   Types of Competence

Metacompetence	Competence description
Problem solving	1. Observe/gather/select/identify/analyze phenomena/situations/cases/documents according to a theory/approach/perspective 2. Compare/justify/confront/question perspectives/approaches/viewpoints 3. Decide/state/make judgements 4. Plan/organize/design an intervention/product/service 5. Argument/question/discuss/interpret 6. Present/synthesize/summarize/describe/characterize in diverse contexts about situations/phenomena/cases 7. Plan/present a discourse (audio, video, text)
Group Work	8. Share information and resources (documents, summaries, e-folios) 9. Exhibit solidarity/peer help 10. Promote group action/interaction (to make suggestions/proposals)
Metacognitive	11. Reflect upon one's trajectory/ learning process/knowledge/goals 12. Analyze/identify gaps of knowledge/wrong turns/shortcomings 13. Self-questioning, explicit/describe learning obstacles
Fluency in ITC use	14.Efficient use of ITC tools 15. Plan/create products to be available online

Aims and Questions

The current project intends to research and develop the pedagogical model for undergraduate courses at Universidade Aberta, and to identify strategies that promote the students' learning and success. In particular, we are concerned with the development of instruments and approaches to continuous assessment, targeted at the promotion of specific competences. In this context, two main research questions were asked: 1) What relationship is there between the concept of competence being used in the e-folios and our current working definition? 2) What are the main characteristics of the e-folios?

Methodology

The methodology used in the whole project is design-based research. Bereiter (2002) defines design-based research as any kind of research that produces findings that are fed back into further cycles of innovative design. The use of design-based research includes five main principles: (i) strategic investigation as an answer for identified problems; (ii) contextualized research focused on the identified problems; (iii) research targeted at innovation and practical applications; (iv) a practice conceived and oriented by research goals; and (v) the existence of research and assessment cycles for the planned interventions. Anderson (2005) specifically refers to the suitability of applying design-based research methods to educational innovation contexts, in general, and to distance education, in particular.

For this research, after the group discussion and clarification around the concept of competence, the second stage was focused on the analysis of a pool of 35 e-folios collected within a sample of volunteer teachers, representing seven different scientific areas: education (n=10), languages (n=10), culture (n=4), literature (n=3), natural sciences (n=2), economy (n=2), and documental sciences (n=4).

In order to develop the analysis, the research team created an analysis grid centered on the following criteria: the course competences; the e-folio competences; types of competences; the assignment; types of task; assessment criteria; instructions; resources; timetable; and structure. This grid of analysis resulted from a previous exploration of a subset of e-folios, under the lenses of the theoretical framework and its application to didactical contexts, as well as from the presented research questions.

In order triangulate data, the team was organized into smaller 3 person groups: each group analyzed a set of e-folios which was afterwards analyzed by another group. Finally, the results were discussed among the members of the team. During this phase, the group felt a strong need to recalibrate, discuss and upgrade the criteria being used to fill out the analysis grid and continuously readjust inter-codification.

Results and Analysis

The collected sample was constituted by 35 e-folios. From this initial sample, 4 e-folios were excluded – 2 because they required the students' participation in an online discussion forum which was then assessed but is not in accordance with the adopted pedagogical model (Pereira *et al.,* 2007), and 2 others because they were not considered to be assessing competences as they were defined by the group; instead, they merely required the students to follow a list of procedures.

The first major result is the fact that the group's definition of competence was always able to accommodate to the types of competences being assessed in the analyzed e-folios. However, our working definition of competence also proved to be considerably larger and to encompass a wider range of metacompetences than what is actually being assessed.

To answer our first research question concerning the relationship between the concept of competence being used in the e-folios and our current working definition, from the 31 included in the final sample all presented a concept of competence that was framed by our larger framework. From the assessed competences, 136 were included in the Problem Solving metacompetence, 0 in the Group Work, 3 in the Metacognitive and 3 in the Fluency in ITC use.

The absence of competences related to Group Work, in this analysis, is a direct consequence of the individual nature of the e-folio task. However, this metacompetence is promoted in other moments of the course, when the students are invited to participate and collaborate through the online forums, among themselves and with the teacher/tutor.

The reduced number of competences related to the Fluency in ITC use may be a consequence of the existence of a very large number of indirect requests related to ITC in this learning environment, consequently its use was not explicitly made or requested; in fact, only 3 e-folios contained them. Moreover, most of the sampled undergraduate degrees include Curricular Units specifically in the area of ITC, in accordance with the

requirements of the Bologna Process (European Commission, 2008b), that have not been included in this sample and that are particularly targeted at the development of ITC use competences.

Related to the Metacognitive metacompetence there were also only 3 e-folios assessing competences associated with the analysis of knowledge gaps. This may be due either to the fact that problem solving is more valued at the beginning of an undergraduate degree, or to the perceived difficulty felt by the teachers to assess metacognitive competences.

The large majority of the competences being assessed in the e-folios are framed by the metacompetence of Problem Solving. In particular, competence 1 (Table 2) was object of assessment in most of the analyzed e-folios (77%), appearing even more than once in several occasions. Competence 6 (Table 2) was the second most frequent competence, being assessed in a large number (45%) of the analyzed e-folios. Competences 3 and 7 were also assessed a reasonable number of times. Competences 2, 4, and 5 were all also assessed but less frequently.

Table 2   Frequency of observed competences

Competence	Frequency
1. Observe/gather/select/identify/analyze phenomena/situations/cases/documents according to a theory/approach/perspective	50 7
2. Compare/justify/confront/question perspectives/approaches/viewpoints	16
3. Decide/state/ make judgments	4
4. Plan/organize/design an intervention/product/service	10
5. Argument/question/discuss	30
6. Present/synthesize/summarize in diverse contexts about situations/phenomena/cases	19
7. Plan/present a discourse (audio, video, text)	

Finally, it was observed that there was a certain diversity concerning the types of competences being assessed in each e-folio: there were 5 e-folios that only assessed one type of competences, 10 e-folios that assessed two types, 11 e-folios that assessed three types and 5 e-folios that assessed four types. It is important to analyze up to which point this variability may be related to the nature of the task being asked, the scientific area, and/or the competences defined for each particular curricular unit.

To answer our second research question we attempted to create a descriptive characterization of the e-folios. Table 3 presents a summary of the main characteristics common to the sampled e-folios. As it might be expected, most of the e-folios included instructions related to the task at hand, the assessment criteria, and the needed resources.

Table 3   Characteristics of the e-folios

Characteristic	Frequency	%
Instructions detailing the steps to take to complete the task	28	90
Instructions related to formal aspects	23	74
Assessment criteria	26	84
Resources	25	81
Timeframe	17	55

The types of tasks also constituted another source of variation. Table 4 presents a summary of tasks in the 31 analyzed e-folios. It is important to notice that some of the e-folios required more than one task (for example, an essay and a practical exercise). From this analysis, the preeminence of essay and practical exercises tasks become clear. This may be due to the fact that the gathered sample is mainly represented by e-folios from the social sciences and the language/literature/culture learning areas.

Table 4   Type of task of the e-folios

Task	Frequency	%
Essay (writing composition, reflection, analysis)	20	65
Practical exercise (application, demonstration)	10	32
Construction of an artifact (blog, pictures, poster, video, slideshow)	5	16
Critical comment (stating an opinion)	3	10
Project (designing a planned action)	1	3
Report (of fieldwork, of experimental work)	1	3
Reading review (reading guide summarizing the main ideas in a text/excerpt)	1	3

In 25 (81%) of the analyzed e-folios the students were required to make use of some kind of resource that was explicitly mentioned. Such set of resources are: texts included in the e-folio (6) (to contextualize or to be used as a tool for reading comprehension); other texts (12) (newspaper articles, research journal articles or book chapters/excerpts); links to external sources (10) (such as blogs, podcasts or videos); and a TV program. This description illustrates the teachers' preference for traditional types of written sources.

A large majority of the e-folios (26 representing 84% of the total sample) also made explicit several aspects concerning the way that the assessment was to be operationalized, while 16% did not include any references to the assessment process. However, the assessment criteria were not always made explicit: in some cases only a scoring rubric was presented, while in others some of the content requirements were mentioned. The level of specification varied considerably.

To conclude, one final aspect of the e-folios that was considered for the analysis was the overall structure in which it was organized. In particular, there was an attempt to clarify the constituting sections of each e-folio. The number of sections ranged from one to nine, in the cases with a higher number of specifications. Examples of the sections include: description of the activity; timetable; resources; objectives; competences; calendar; formal instructions; assessment criteria; estimation of student time required to complete the e-folio. Others presented a simpler structure, closer to a traditional written examination/test, and included only 2 to 4 sections (such as reading comprehension and written comprehension). In our sample, two subsets emerged: 61% of the e-folios contain four or less sections, while 39% of the e-folios are constituted by seven to nine sections. This appears to indicate two different conceptions of the way to present the e-folio to the students, one with a very structured and specified organization, and another exhibiting the opposite tendency, i.e. not valuing a detailed structure. As a matter of fact, the adopted pedagogical model (Pereira *et al.,* 2007) is sufficiently open to allow a wide range of tasks and structures.

Conclusions and Implications

From the analyzed e-folios, it becomes clear that the assessed competences were all framed by the concept of competence assumed by this research group, although they are not always presented with a clear formulation. The most valued type of competence was clearly "problem solving". Within this metacompetence, most of the e-folios required the students to "gather and analyze information". The majority of them required the "synthesis of perspectives", while others asked the students to "plan and design a discourse", and demanded the students to "make judgments". Finally, a few of the e-folios required students to "argument and discuss situations/cases", to "confront viewpoints", and to "design a project".

Although the assessment of the fluency in ITC use competence only appeared in a reduced number of e-folios, it is an underlined assumption to the concept of the e-folios, given their digital nature. Furthermore, several of the analyzed e-folios explicitly required online research tasks, while others required the use of diverse software, what is aligned with the "efficient use of ITC tools" competence (number 14 in Table 1). The absence of the metacompetence "group work" in the analyzed e-folios can be considered an expected result, given the individual nature of the work required in them.

In this sample of e-folios only a small number of situations promoting the assessment of metacognitive competences were observed. On the one hand, this may be due to the small sample and because the analyzed sample was drawn from curricular units belonging, in general, to the 1st year of several undergraduate degrees; on the other hand, the paradigm shift towards a student-centered learning environment is also recent at the

University and probably responsible for the lack of investment in the development and assessment of metacognitive competences. Given the fact that this is an exploratory study, we stress the relevance and need of increasing the sample size, particularly the number of e-folios from 2nd and 3rd year curricular units, as well as e-folios from other scientific areas.

The used pedagogical model (Pereira *et al.*, 2007) has improved and expanded the possibility of using alternative assessment strategies. These new alternative assessment strategies can be implemented not only in the e-folios but also in the types of resources and the tasks designed by the teachers. However, the e-folio is still a very recent tool, with only one year of implementation, and this fact may be responsible for the strong emphasis on textual based resources and essays. The use of textual based resources is often appropriate and recommended to develop problem solving types of competences. Nevertheless, it is expectable that in the future, with the development and consolidation of the change process, the variety of resources and types of tasks being used will increase considerably.

There is also a clear awareness from the teachers of the need to include information about their assessment practices in the e-folios. However, a lack of clarity about what to include about assessment seems to persist. This aspect is particularly relevant given its pertinence to student learning (Birenbaum, 2003; Brown, Bull & Pendlebury, 1997).

Moreover, there is not a clear structure pattern for the analyzed e-folios, reflecting several interpretations of what an e-folio may be. However, in particular areas such as foreign languages learning, the emergence of a pattern of e-folios with similar structures is apparent. Furthermore, based on the produced analysis, this group believes that particular sections in the structure of the e-folios are especially important and ought to be explicit for the student performance and learning. These sections may include: the competences being assessed; the assessment and scoring criteria; the task that the students are expected to perform; and formal requirements to be met. This is mainly important in a distance learning framework, where the student is not physically present, and it becomes necessary to provide him with clear prompts about how to organize his/her work and so promote a student-centered learning environment.

Finally, the sharing of these preliminary results may assume a relevant role for the teachers who are currently using this new tool, or will be in the future, in order to promote a reflective analysis about their own assessment practices.

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