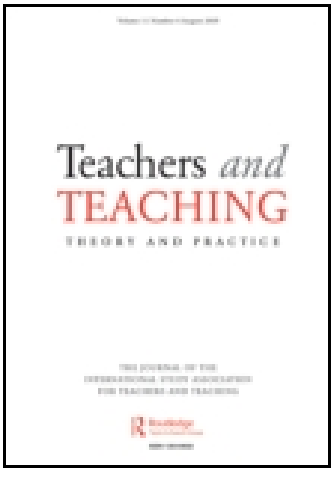

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Formative assessment of teachers in the context of an online learning environment

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This case study looked at how an assessment strategy designed for an online learning environment can support teachers' professional development. More specifically, we intended to evaluate how a particular online assessment design can help the participating in-service teachers to recognize the added value of formative assessment, and promote their own use of formative assessment in their professional classroom practices. The presented assessment design consists of a combination of different, non-standard assessment methods in an online environment. We analysed data from 494 questionnaires, the participants' critical reflections about their learning and the participants' produced artefacts. The findings illustrate the participants' recognition of the formative character of the proposed assessment design, reflected not only by the high scores reported in seven of the eight themes explored, but also from the qualitative analysis of the participants' reflections and artefacts. Suggestions are offered for the improvement of the proposed assessment design, so as to better promote the formative character of assessment. In particular, implications for the development of formative assessment in online professional development are discussed taking into account its potential to promote the participants' self-regulatory learning processes.

Keywords: in-service teacher education; professional development; formative assessment; assessment design

Introduction

With the development of Information and Communication Technologies and the emergence of web 2.0, teaching has increasingly resourced to technological tools for content production and distribution, as well as computer-mediated communication. The e-learning explosion and the emergence of new digitally supported learning environments emphasize the necessity of rethinking current teaching and learning perspectives. If properly used, these new technologies can promote the transformation of teaching practices towards a student-centred perspective, and so add value to the learning process.

This new learning culture, discussed by Garrison and Anderson (2003), McConnell, (2006), Pereira et al. (2009), and Anderson and Dron (2011), where technological mediation is the cornerstone, is characterized as being fundamentally collaborative and emphasizing the importance of multiple perspectives, attributing

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to the learner a central role in his own learning process, and accentuating the formative nature of assessment.

In this article, we introduce an assessment design for an online teacher professional development context. This assessment design is framed by a conceptual framework for formative digital assessment (Pereira et al., 2009; Pereira, Oliveira, & Tinoca, 2010). Moreover, we intended to evaluate the participating teachers' perception of the proposed assessment design and its perceived impact on their professional development.

Professional development and formative assessment

The teaching career is framed as a continuous personal and professional development process, including not only the development of the teachers' knowledge and competences, but also of their personal self, with its associate beliefs, idiosyncrasies and life stories and the context where their activity takes place (Fullan & Hargreaves, 1992). In fact, teachers go through a professional development process that includes not only what they learn in formal settings, but also the knowledge that emerges from their own experiences and practices. This process includes a continuous dialogue between theory and practice supported by critical reflection (Ponte, 1998). The teacher is recognized as a reflexive practitioner with previous experiences that build new knowledge from the reflection of his own practice. Professional development is, therefore, a complex process where a variety of facts take part such as the working contexts, training opportunities and individual characteristics (Fullan & Hargreaves, 1992; Lieberman, 1994; Ponte, 1998). To become a professional implies the expansion, development and reconstruction of our own knowledge and practices, demanding that the individual acts as a participant in his own learning process.

Therefore, when we aim to promote teachers' professional development, it is important to understand the process promoting teachers' professional growth and the conditions that facilitate it. One of the main goals of professional development must be to help the teachers to revisit theories and practices (Tillema & Smith, 2009), always taking into account that their professional development is the cornerstone to assure the quality of learning of their students.

In Portugal, the current legislation (Ministério da Educação, 2001) defines four dimensions for the teachers' competence profile: professional, social and ethical, development of teaching and learning, participating in school and relations with community and lifelong professional development. In particular, according to this last dimension, teachers should incorporate professional development into their professional practice as a cornerstone, building it from their identified needs, and through the problematized analysis of their pedagogical practice, and the reflection of the development of their profession with the resource to research about their practice, with the cooperation of other professionals.

Teachers are required to be creative and reflexive practitioners with the ability to develop knowledge independently and solve complex problems. This represents a new paradigm for teaching where it is necessary to promote learning environments capable of sustaining deep learning anchored in real contexts. Taking into account these new settings, assessment must also go beyond the measurement of knowledge reproduction which emphasizes the necessity for a new assessment design. Furthermore, this paradigm shift is illustrated by Elwood and Klenowski (2002), when they distinguish 'assessment of learning' as assessment focused on

measurement and scaling, from 'assessment for learning' as assessment meant for the students, through feedback, to understand their own learning processes and the goals that they intend to achieve.

This new assessment culture is characterized by:

- Seamless integration of assessment with the teaching progress (Birenbaum, 1996)
- Student participation in the development of his own assessment in dialogue with the teacher (McConnell, 2006)
- Assessing both products and processes (Linn, Baker, & Dunbar, 1991)
- Non-standardized assessment methods associated with teaching practices (Dierick & Dochy, 2001)
- Using a variety of assessment methods similar to real/professional life contexts (Herrington & Herrington, 1998; Resnick, 1987)
- Emphasis on student reflection about their learning (McConnell, 2006)
- Valuing a qualitative description of performance in detriment of a quantitative classification (Birenbaum, 1996)

As Sainsbury and Walker (2007) emphasize, it is necessary to take an approach which incorporates collaboration into a wider range of assessments, and which provides useful timely feedback, and thus has the potential to harness the motivating force of assessment into the effective promotion of learning during the assessment process itself. Nicol and Macfarlane (2006, p. 199) consider feedback as the information student's receive about how their present state relates to proposed goals and criteria. Students create internal feedback when they are capable of monitoring their development of the learning tasks, and assess their own progress towards the proposed goals. For these authors, this concept includes not only the cognitive process, but is also regulated by motivational beliefs. As these authors emphasize, 'formative assessment and feedback should be used to empower students as self-regulated learners'.

According to Hattie and Timperley (2007, p. 8) 'feedback is conceptualized as information provided by an agent (e.g. teacher, peer, book, self, experience) regarding aspects or one's performance or understandings'. Without feedback, participants lack the opportunity to frame their learning and development. Feedback can also be insufficient to enhance further learning, such as when only a numerical classification is provided, or when received too long after the assessment task. These authors present four levels of feedback: (i) task level, feedback related with the task interpretation or with the attained results; (ii) process level, focused on the processes necessary for the task development, such as giving cues that lead to better strategies; (iii) self-regulation level, related to self-monitoring, directing, and regulating of actions; and (iv) self-level, centred on personal evaluations and their effect on the learner. Also, in online contexts, we can find all these levels of feedback; such as when during an online forum the proposed activities are discussed and clarified, or when, at the end of an assessment task, the lecturer provides the participant with feedback about his or her performance and suggestions for improvement. Furthermore, the cognitive gains fuelled by feedback may enable reflection and an expansion of the knowledge to other situations, as well as bigger metacognitive awareness while promoting self-assessment and self-awareness (Herrington & Herrington, 1998).

Assessment design in an online environment

In teacher professional development in an online environment, the assessment design should aim to promote the development and use of metacognitive skills. As Vovides, Sanchez-Alonso, Mitropoulou, and Nickmans (2007, p. 64) emphasize, 'e-learning environments can have potential added learning benefits and can improve students' and educators' self-regulation skills, in particular their metacognitive skills'. Our assessment design was developed taking into account the quality of assessment in an online environment, and emphasizing the four dimensions proposed by Pereira et al. (2010): authenticity, consistency, transparency and practicability. Authenticity is conceptualized as the need to warrant that online assessment tasks are complex, related to real-life contexts and recognized as significant by students, teachers and employers; consistency stresses the importance of aligning the competences being assessed with the assessment strategies being used and the assessment criteria, as well as the need to use a variety of indicators; transparency is related with participant engagement in online tasks through the democratization and visibility of the assessment strategies being used. What is more, assessment in an online environment refers to practices that may provide several benefits, such as: immediate feedback, greater variety and authenticity in assessment designs, improved learner engagement (for example through interactive formative assessments with adaptive feedback) and increased opportunities for learners to act on feedback (for example by encouraging reflection in online forums).

Within this context, our assessment design consists of a combination of non-standard assessment methods, including alternative forms of assessment: the e-folio and the p-folio. 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, Mendes, Morgado, Amante, & Bidarra, 2007, p. 19). The e-folios are complemented by a p-folio that takes place in a face-to-face setting. Moreover, these new assessment strategies are framed by a pedagogical model for online learning (Pereira et al., 2007) supported by a curricular unit plan (CUP) and a formative activities plan (FAP). The CUP is a document which is presented at the beginning of the course/curricular unit and guides the learning process. It is accompanied by an online forum where the participants can question and debate its contents. This document clarifies aspects about the course, such as the contents, the objectives and the competences to develop, the formative activities plan, the assessment methods and criteria as well as the teacher's expectations regarding the in-service teachers' participation. Furthermore, by creating the conditions for student's self-regulatory processes through self-monitoring and self-evaluation strategies, we are promoting the development of their own self-efficacy (Schunk & Pajares, 2001; Zimmerman, 2000).

The aim of the FAP is to potentiate the formative processes of this model by guiding the participants' exploration of the available resources, prompting and supporting their interaction in the online forums. The FAP requires that the participants complete a set of tasks proposed by the lecturer, such as a research assignment or developing an artefact, and consecutively share their experiences in the online forums with their colleagues. In this way, promoting critical conversations about their experiences where students 'co-construct their professional selves through interactions with informed and involved partners/mentors invested in their development'

(Carter, 2005, p. 485). Consequently, the FAP helps participants to identify strengths and weaknesses in their learning and to reflect upon these aspects while interacting with their peers and with the lecturer. Therefore, the FAP is a cornerstone to the development of the in-service teachers' critical metacognitive skills such as planning, self-regulation and self-evaluation, to manage the learning process and engage in online inquiry (Vovides, Sanchez-Alonso, Mitropoulou, & Nickmans, 2007).

Figure 1 illustrates the general learning path under the proposed model. This learning path is framed by the presented CUP and supported by several moments of interaction and activities throughout the semester. This model is characterized by cyclical modes of interaction where the participants engage in online forums, complete the proposed FAP, and culminate in a formal assessment activity – the e-folio and the p-folio. These cyclical modes of interaction should be complemented by individualized and reflective learning. Even though each of the available forums is scheduled to take place during certain periods/weeks, they are always available online and can be revisited by the participants as often as necessary, and at any moment throughout the semester.

The e-folios include instructions detailing the steps to be taken in order to complete the proposed task, the activity's assessment criteria and instructions related to formal aspects (such as online submission procedures). The e-folios can last from a few days to a full month depending on the nature of the required task. Pereira et al. (2009) presented a summary of the types of tasks usually required in the e-folios (see Table 1). It is important to notice that some of the e-folios required more than one task (for example an essay and a practical exercise).

As mentioned before, the e-folios are complemented by a p-folio that takes place in a face-to-face setting. The p-folio was introduced as a crucial tool for the certification of the assessment process as a face-to-face moment where the participants are required to be present at an institutional regional centre, taking the form

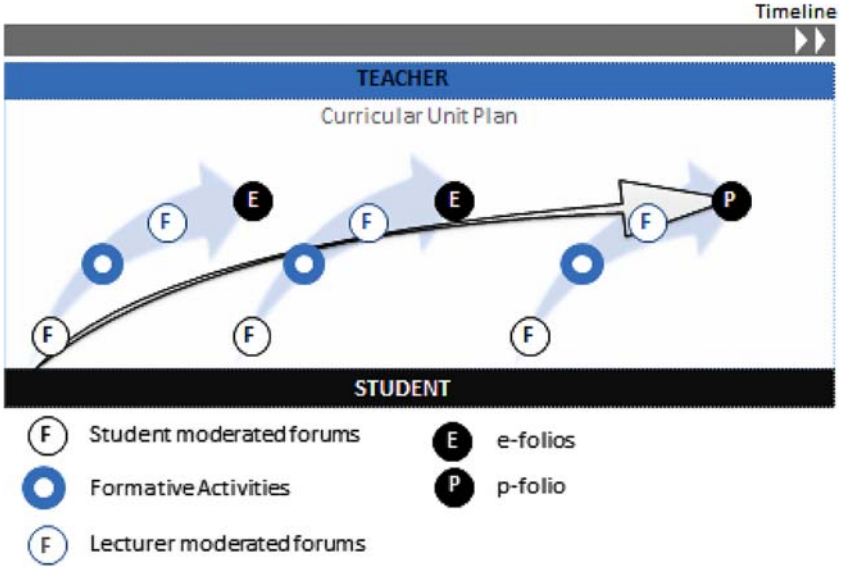

Figure 1. An illustration of the proposed learning path.

Table 1. E-folios tasks and definitions.

Task	Definition
Essay	writing composition, reflection, analysis
Practical exercise	application, demonstration
Construction of an artefact	blog, pictures, poster, video, slideshow
Critical comment	stating an opinion
Project	designing a planned action
Report	of fieldwork, of experimental work
Reading review	reading guide summarizing the main ideas in a text/excerpt

of a written examination, presentation of a project or a report. Both the e-folios and p-folios applied in combination 'provide evidence of the extent to which the student achieved the competencies expected in a given curricular unit' (Pereira et al., 2007, p. 20). Moreover, students are required to achieve at least 50% of the total score on the sum of the e-folios in order to be allowed to go on and complete the p-folio at the end of the semester. According to the presented model, the p-folio must represent 60% of the final grade.

With this study, we aim to illustrate how an assessment design for online learning, composed by a combination of different non-standard assessment methods, can be used to support in-service teachers' professional development. The proposed research questions are: how useful do teachers find the proposed assessment design for online learning for their professional development? In particular, what is the formative potential of the FAP and the online forums? And how do the e-folio tool and the associated feedback contribute to the teachers' professional development?

Method

The context

During the last decade, due the broadening offer in Portuguese K-12 education, a large amount of teachers have entered the educational system, from a variety of scientific areas, without formal pedagogical teacher training. Universidade Aberta, being a public distance teaching university, developed an online professional development programme for teachers with a duration of two semesters, and composed of a set of seven courses: Education and Society, Conflict Management, Practice and ICT, Pedagogical Assessment Models, Didactical Principles, Ethics and Education and the Practicum Seminar, for a total of 40 ECTS. The present study was developed in two of these courses: 'Practice and ICT' and 'Pedagogical Assessment Models'; chosen because of their particular emphasis on assessment practices and on the use of ICT in education.

Participants

This programme was developed in an online learning environment during the 2010/2011 academic year and enroled 630 in-service teachers organized in 13 virtual classes. Each course was chaired by a lecturer responsible for the entire instructional design and assessment, and supported by a team of 5–7 online tutors. The in-service teachers had been developing their teaching practice for, at least, five

years, but some of them had been teaching for as long as 10 or 12 years, and were teaching at the 5–12th grade levels. The participating teachers represented a variety of scientific areas such as Music, Science, Mathematics, Portuguese, English, Geography, History and Computer Science.

Procedure

The two authors worked collaboratively as the lecturers in charge of the two chosen courses. Given the framework established by the institutional pedagogical model, the proposed assessment design was developed trying to capitalize on the potential of the available resources. Namely, the use of the online forums and of the formative activities plan, as well as the different types of feedback associated with each activity. The e-folios and p-folios were regarded as complementary, and required the participating teachers the development of different types of tasks. In particular, the e-folios required the teachers to construct classroom artefacts and critically comment on their application. The required artefacts included the construction of alternative assessment tools and rubrics such as blogs, e-portfolios and wikis. The p-folio took the form of a written examination where the participating teachers were required to reflect about their learning process throughout the course and its relationship with their professional practice. At the end of the semester, the participants were requested to fill out an evaluative questionnaire, and to write a critical reflection about their experiences throughout the courses.

Instruments

For the present study, we used three main data-collection strategies: a large-scale anonymous online questionnaire to be completed at the end of the semester; the participating teachers' critical reflections about the assessment strategies used; and their productions throughout the semester.

The course evaluation questionnaire

The online questionnaire was adapted from Pereira (2009) taking into account the proposed assessment design, including five sections focused on the proposed contents, the pedagogical methods, the learning materials and the assessment process. The survey included 40 questions with a four-level likert scale, ranging from totally disagree, to totally agree. The questionnaire was developed with eight main themes: contents, digital learning resources, formative activities plan, online forums interactions, regulatory processes, transparency, e-folios and feedback. These themes were developed taking into account not only the pedagogical strategies inherent to this pedagogical model (Pereira et al., 2007), but also the presented framework for digital assessment (Pereira et al., 2010).

In order to validate the developed themes, for this new population, the Cronbach's alpha index was calculated for each theme. Table 2 presents a description of the proposed themes and the associated Cronbach's alpha indexes. The internal consistency of all themes was high (Cronbach's alpha larger than .75) illustrating the reliability of the proposed themes.

The total number of responses to the survey was of 265 and 229, respectively, for both studied courses, giving us a total $N = 494$. No significant differences were

Table 2. Dimensions of analysis.

Themes	Definition	Cronbach's alpha
Contents	The contents studied in each course	.810
Digital learning resources	All online learning resources (books, articles, videos, blogs, wikis, etc.)	.757
Formative activities	Set of tasks presented by the instructor including guidelines towards possible answers	.828
Online forums interactions	Discussions on the online forums	.805
Regulatory processes	Analysis and reflection aimed at the improvement of one's own learning and practice	.891
Transparency	Adequacy and justice of the assessment practices	.894
e-folios	A short digital document elaborated by the student and published online	.844
Feedback	Information given to the participants about the e-folio to perform it more effectively and to improve their learning and practice	.862

observed between the two chosen courses. All themes included three to four items. Examples of items are: 'After the feedback from the first e-folio I improved my study plan' (feedback); 'the participants interaction in the online forums was very productive' (online forums interactions); and 'the proposed assessment activities where adequate to the competences that we needed to develop in this course' (transparency).

Critical reflections

Also at the end of the semester, the participants were requested to write a critical reflection about the most and least positive aspects of the course, taking into particular account the proposed assessment strategies, as well as any suggestions for improving the course.

Artefacts

The participants' productions throughout the semester, including the interactions in the online forums, the e-folios and the p-folios, were also collected in order to illustrate their reflective and metacognitive skills and accomplishment of the proposed competences.

Analysis

This research is based on qualitative case study methods as described by Yin (2003) and Stake (1995). This case study is supported by a mixed methods approach (Cohen, Manion, & Morrison, 2000; Mercer, Littleton, & Wegerif, 2009) aimed at producing a description of the proposed assessment design. This account was based on several triangulated sources of data, including written artefacts of the participants' work, an online survey of the in-service teachers' perceptions and experiences and transcripts from the online discussion forums.

The course evaluation questionnaire was analysed as follows. For each theme, the mean score and standard deviation were calculated. In order to facilitate interpretation, the results were converted into a percentage scale. With regard to the scores, we made a distinction between low (0–33), medium (34–66) and high (67–100) scores (Baartman, Gulikers, Dijkstra, & Blankert, 2011). Moreover, to get an impression of which categories got high and low scores, the overall mean score for all categories was calculated. Since the normal distribution and homogeneity of variance requirements were verified, one-sample Student's *t*-tests were used to compare the scores on the eight themes to this overall mean score.

The analysis of both the participants' online postings and their critical comments involved: (a) reading and questioning the data taking into account the posed research questions; (b) identification of the main concepts in accordance with defined themes; and (c) subsequent refinement of the analysis. Coding was conducted by both researchers, and any differences were further discussed allowing intercoder reliability to reach 93%. The e-folios and p-folio were graded according to an analytical rubric developed by the course lecturers.

Results

Taking into account that the used virtual pedagogical model requires participants to achieve a minimum of 50% in their set of e-folios, in order to be allowed to continue their assessment path towards the p-folio, we should start by stressing that 98% of the participants were allowed to continue towards the p-folio. Moreover, the overall mean score in the e-folios was of 80%, illustrating the participants' high level of achievement of the proposed competences, in particular, the construction of complex classroom artefacts and the development of a coherent discourse sustained in their professional practice.

Table 3 shows the mean scores and standard deviations for each of the proposed themes. From this analysis, two categories stood out as significantly different from the overall mean score ($M = 73$): the e-folios ($t(485) = 120.35$, $p < .01$) and the online forums interactions ($t(493) = 102.35$, $p < .01$). Three different levels clearly emerge from the presented data. Firstly, the e-folio was clearly the theme with the highest score, presenting a mean of 83%, illustrating the considerable value attributed to it by the participating teachers. Secondly, there were a set of six themes with high scores (more than 67%) but clearly indistinguishable between them including: contents, digital learning resources, formative activities, feedback,

Table 3. Mean score and standard deviation for the 8 established dimensions.

Dimensions	*M* (%)	SD (%)
Themes (4 items)	74	14
Digital learning resources (4 items)	74	13
Formative activities (3 items)	73	16
Online forums interactions (4 items)	64*	14
e-folios (4 items)	83*	15
Feedback (3 items)	71	18
Transparency (3 items)	72	15
Regulatory processes (4 items)	73	14

Note: *$p < .01$.

transparency and regulatory processes. And finally, there was one theme – online forums interactions – with only a medium score (64%). It should also be noted that the standard deviation for the feedback theme was slightly larger than average. Possible explanations for this are presented later.

Next, we present these eight themes in four groups of two each and illustrate their interpretation with the participating teachers' critical reflections about the proposed assessment design.

Contents and digital learning resources

Concerning the themes related to the proposed contents and digital resources explored in these two courses, it can be observed that the teachers have clearly positive reactions to the proposed contents and to the variety of available resources. This can be further emphasized from their reactions on the critical commentary, such as when Ana says 'the proposed contents and the way they were tackled was of tremendous importance'; or when Susana commented that 'it was very positive to have such a wide range of resources available, and also to be able to go even further and research new material beyond the suggested resources'. However, even though most teachers recognized the relevance of the proposed contents for their practice, such as when Carlos stated 'the contents studied here were of great personal and professional interest, giving me the opportunity to implement new assessment and teaching methods', there were also some, like Patricia, who felt that the contents were too theoretical saying 'I find this course too theoretical, given its relevance for classroom practice'.

Formative activities and online discussion forums

The formative activities and the online discussion forums represent the bulk of the work done by the participants throughout the semester. Here, we can notice two clearly different reactions from the participants. Concerning the formative activities plan, the participants recognize their value, as can be seen when Carla says 'in my opinion the formative activities plan contributed for me to be able to bring together practice and theory' or when Pedro commented 'in our profession practice is so important, that it really helped to have the theory being accompanied by the formative activities'. However, as far as the online discussion forums were concerned, the reactions were clearly less positive. Teresa recognizes this saying that 'the lack of participation in the forums was clearly the point that I want to highlight as less positive'. It should be noted that in the used pedagogical model, the participation in these online forums is voluntary and not assessed. Nevertheless, and in spite of this less positive result, those participants who did interact in the forums report a positive opinion, such as Carlos when he says 'I felt the forums were important and allowed me to clarify and explore the questions I had throughout the semester' or Vanda when she comments 'the tutors always accompanied our work (in the forums) and clarified all questions when necessary'.

e-folio tools and feedback

Clearly, the most positive result from this study was the participants' very positive reaction towards the e-folio tool (83%), which also contributed to the very good

attained results. First of all, earlier research has shown that, even though the imposed pedagogical model advocates for the use of this tool, a variety of interpretations may exist with regard to what can be requested from the students (Pereira et al., 2009). However, in this case, the researchers/lecturers adopted a similar pedagogical approach and structure for the proposed e-folios in the two studied courses. The formal structure was similar and included four sections (even though not always in the same order): (1) introduction and presentation of the required tasks in a clear and objective tone; (2) description of the competences being assessed; (3) presentation of the assessment and scoring criteria; and (4) formal specifications about the electronic submission of the final product. Also, both lecturers designed e-folios where the participants were given one week to analyse or develop an artefact relevant for the course and their professional practice (such as an assessment tool or a blog).

The positive reactions towards the e-folios are also clearly illustrated by the participants' comments such as when Rita said that 'the e-folios, despite the time they took, were very important, because they allowed me to tackle very important contents for my practice in a very stimulating way' or when Carolina stated that 'the completion of the e-folios was a very effective way to motivate us to research and further our knowledge'.

However, the feedback not only particularly associated with the e-folios, but also throughout the other activities during the semester, even though having a positive reaction from the participants (71%), was not at the same level as the e-folios themselves. This is illustrated by the participants' critical comments, such as when Rafael recognizes that 'the feedback to our e-folios represented guidance for our study and contributed to my self-assessment'. Nonetheless, it should also be pointed out that this was the theme with the highest standard deviation. This may be due to the large number of participants per class, and the very good results attained in the e-folios meant that the lecturers opted for only providing short reinforcing feedback to those participants who had done very well with their tasks, that ended up representing a significant portion of the group.

Transparency and regulatory processes

According to our perspective, transparency contributes to the formative nature of assessment by clearly making available to the participants all information regarding how and when the assessment tasks are going to take place, and about the assessment and scoring criteria. In this case, this was attained through the information provided in the PUC, on the e-folio instructions and, when requested, on the accompanying forums. Also, we were particularly interested in evaluating our assessment design's contribution to the participants' regulatory processes and associated formative nature of the proposed assessment tasks. The achieved results in these themes were quite satisfactory (72 and 73%) representing the participants' recognition of these features in their courses. This can be further illustrated by the participants' critical comments such as when Duarte says:

> I had a clear idea (since the beginning) of what the assessment criteria were and about how my classroom practice could improve towards as much transparency as possible … it's curious that something so evident is often the exception instead of the rule.

Discussion

The results of this study support the proposed assessment design's capacity to enhance in-service teachers' professional development, contributing to the emergence of critical reflection centred on their professional practice. This is partially promoted, as Carter (2005) argues, by the opportunities given to the teachers to share and discuss, in the online forums, their tacit knowledge with their colleagues, coming from a variety of geographical locations throughout the country (both rural and urban) and with a very diverse set of professional experiences. As Fullan and Hargreaves (1992) and Ponte (1998) stress, teachers' professional development is a complex individual and collective process, dependent on professional contexts and training opportunities. In this study, the teachers' attention was further focused on the learning promoted by the assessment task (e-folio) and accompanying feedback by the lecturer, even more than on the online debates. The e-folio was the tool towards which the participants showed the most positive reactions, particularly recognizing its impact on their formative assessment and regulatory processes (Nicol & Macfarlane, 2006). The lecturers develop e-folios where the in-service teachers were asked to complete open-ended, unstructured, tasks related to their professional life, adapted to their own classroom practice, and requiring them to analyse and reflect about its classroom impact, promoting the development of their own self-efficacy (Zimmerman, 2000). In such a way, the in-service teachers were granted with the opportunity of incorporating training as a central piece of their professional development, focused on their perceived needs, and on the analysis and reflection on their own practices (Ministério da Educação, 2001). The participants' comments, and positive reactions towards the e-folio tool, strongly suggest its recognition as an authentic activity, aligned with their professional practice (Herrington & Herrigton, 1998). Moreover, the clarification of the assessment criteria allowed the in-service teachers to interpret and answer the assessment task (e-folio) taking into account their appropriation of knowledge. The lecturer's work was aligned with the proposed criteria, and the feedback was provided not only as a final score but also as written commentary, targeted at the self-level feedback centred on the participants' productions (Hattie & Timperley, 2007). On the other hand, the feedback provided during the forum interactions that is more aligned with the task-level and the process-level feedbacks, has not been explored in this study in its fullest potential. This is clearly a scenario where the potential for assessment as communication between the in-service teachers and lecturer can be further explored. As Tillema and Smith (2009) suggest, teachers often find it hard to expose their reasoning and, in this context, this may also be due to the participants' reported lack of time, and with their difficulty to assume a more participatory role than what they are used to. Even so, as McConnell (2006) points out, the participants who are unable or unwilling to fully participate in these online forums, and adopt a more 'lurking' attitude, can still benefit from the visibility of their colleagues online discussions.

Furthermore, we consider that the different types of feedback and the interactions in the online forums are crucial in the proposed assessment design, as reported by the in-service teachers. However, these characteristics represent an increased workload for the lecturers, responsible for online classrooms with up to 60 participants, and coordinating a total of 13 classes. This problem was also discussed by Nicol and Macfarlane (2006) and can be one of the reasons for the increased variance of the participating teachers' perceptions regarding the provided feedback.

Implications

One of the main contributions this study intends to make is promoting the quality of assessment in general and its capability to promote the formative character of assessment, particularly in the context of online professional development. Here, the construction of the assessment strategy was designed under the framework of the pedagogical model being used, but taking into careful consideration the authenticity and transparency of the proposed strategies and their formative impact on the teachers' practice. However, there are other dimensions contributing to the quality of assessment that should be further explored and introduced into the development of online assessment strategies. Pereira et al. (2010) proposed a new conceptual framework for assessment in an online environment based on four dimensions: authenticity, consistency, transparency and practicability; and further developed into 15 criteria. In order to enhance the quality of this assessment design, these dimensions and criteria should be incorporated in the development of the proposed assessment strategies.

Furthermore, considering the proposed assessment design, two main implications should be emphasized. On the one hand, the quality of the online forum discussions should be reviewed. In online distance education, the online forums are a pivotal tool to mediate the participants' interaction processes (McConnell, 2006). In the present study, it was clear that this was a tool that did not benefit all participants equally. Also, the size of the virtual classroom should be reviewed, as a smaller classroom may promote greater commitment and enhance the participants' interaction. On the other hand, the potential of the e-folio tool must be emphasized. If designed in accordance with the suggested criteria, it has a clear potential to promote the formative character of assessment, serve as a motivator for the participants learning and as a valuable source of feedback for their regulatory processes.

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