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A learning design to promote changes in teacher´s digital assessment practices

Un diseño pedagógico para promover cambios en las prácticas de evaluación digital de los profesores

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ABSTRACT

In this article, we present the design of an ongoing training course for teachers in non-tertiary education with the aim of promoting a change in their assessment practices towards digital assessment of competences from a sustainable assessment perspective. Using a qualitative approach, we analysed the interactions that took place in the different virtual forums, as well as the reports produced at the end by the participants. Our aim was to find out what the main challenges were for these teachers, while at the same time trying to understand which dimensions of the training process enabled the teachers involved to design and implement strategies for assessing competences using technology. We found that the participants' main difficulties were in changing the focus of the assessment, going beyond the mere assessment of knowledge, as well as in constructing appropriate rubrics for the assessment of competences. Important aspects of the training programme were i) the dimension of collaboration between peers, ii) flexibility in terms of the technologies to be used, considering different digital literacy profiles and iii) the creation and application of pedagogical strategies by the teachers during the training.

KEYWORDS

Digital assessment; Competence; Teacher training; Learning design; Collaboration.

RESUMEN

En este artículo presentamos el diseño de un curso de formación permanente para profesores de educación no terciaria, con el objetivo de promover un cambio en sus prácticas de evaluación, con vistas a la evaluación digital de competencias desde una perspectiva de evaluación sostenible. Mediante un enfoque cualitativo, analizamos las interacciones que tuvieron lugar en los distintos foros virtuales, así como los informes elaborados al final por los participantes. Exploramos cuáles eran los mayores retos para estos profesores y, al mismo tiempo, intentar comprender qué dimensiones del proceso de formación permitían a los profesores implicados diseñar y aplicar estrategias de evaluación de competencias mediante el uso de la tecnología. Encontramos que las mayores dificultades de los participantes residían en cambiar el enfoque de la evaluación, yendo más allá de la mera evaluación de conocimientos, así como en la construcción de rúbricas adecuadas para la evaluación de competencias. Las dimensiones importantes del programa de formación fueron i) la colaboración entre compañeros, ii) la flexibilidad en cuanto a las tecnologías a utilizar, teniendo en cuenta los diferentes perfiles de alfabetización digital y iii) la creación y aplicación de estrategias pedagógicas por parte de los profesores durante la formación.

PALABRAS CLAVE

Evaluación digital; Competencia; Formación profesores; Diseño pedagógico; Colaboración.

RECOMENDED CITE

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Main contributions of the article and future research lines:

- Contributions to teacher training focusing on digital assessment of competences from a sustainable perspective.
- Futher research: broadening the training design to other techers with a view to transforming their assessment practices.

1. INTRODUCTION

The teaching-learning process has changed in recent decades due to the social changes that have taken place, including the diversity of students and their needs and the role that technology is playing in all professions. Associated with this change are new learning spaces, physical and virtual, and dynamic forms of collaboration that have been studied in research (Monsalve-Lorente & Aguasanta-Regalado, 2020). In these complex contexts, it is crucial to innovate teacher training formats, entangled theory and practice, promoting reflection on practice, and stimulating reflection with peers. Assessment practices are in the process of changing in Portuguese schools, with a focus on formative assessment from a self-regulated learning perspective (Nicol, 2021; Nicol & Macfarlane-Dick, 2006; Panadero & Jönsson, 2013; Panadero et al, 2019).

Teacher professional development requires ongoing investment in training and updating, which becomes increasingly important when it comes to using available technologies pedagogically. This includes the mobilization of technology to adopt digital assessment practices that go beyond the use of tools for the mere testing of knowledge. It is important to rethink technology-enhanced assessment to develop competences that prepare students for lifelong learning (Boud, 2000).

Within these, we include communication, problem-solving, critical thinking, teamwork, digital literacy, and creativity and innovation, which are described in international documents (OECD, 2005, 2018).

Continuing professional learning for teachers (Boeskens et al, 2020) emphasizes learning, competences development, and practice transformation through peer collaboration and involving intervention in real-world situations.

On the other hand, the complexity of school contexts and the diversity of teachers' professional experiences raises the need to develop new training designs that can set up flexible learning ecologies, adaptable to teachers and contexts, based on collaboration between researchers and practitioners (Valverde-Berrocoso, 2016). Authors such as Akkerman and Bakker (2018) highlight that emergent practices rely on a set of actors, interactions, technologies, resources, and various types of spaces.

Bearing this in mind, we designed and implemented a course for teachers aiming to promote the adoption of good practices on sustained digital assessment of competence.

Two research questions guide the current study:

1) What are the main challenges experienced by teachers in implementing digital assessment of competences?
2) What dimensions should be considered in a learning design scenario that promotes changes in teachers' digital assessment practices?

1.1. Competences assessment

Competence is a complex construct, reflecting the ability to successfully respond to a personal and/or societal request or to perform a task that requires the mobilization of knowledge (implicit and/or explicit), skills, abilities, capacities, attitudes, emotions, and values (authors, 2015). Competences develop in interaction and action, in educational (formal or informal), professional, and social contexts, and require much more than the reproduction of acquired knowledge.

The complexity of the competences implies placing the student before a challenge to which he or she must respond. In turn, the student must produce something, for example, a solution to a problem, the construction of an artifact, the preparation of an essay, or a report. In designing an activity appropriate for the assessment of competences, it is important to consider what the student must mobilize holistically in its realization. Demonstrating a competence is not done in the abstract (Cano Garcia, 2008). In addition, the introduction of technologies into assessment processes means that they need to be selected according to the competences to be assessed, considering the context (Bennett & Abusalem, 2024).

To clarify these issues, it's fundamental to be more precise when we talk about assessing competences using digital devices. For this reason, it is important to consider tasks specifically designed for competence assessment with the support of digital technologies. Designing these tasks involves considering the competencies to be developed and the use of electronic devices for its accomplishment. Ultimately, this is always the teachers' responsibility, but it can be open to the students' choices about suitable technological devices and ways of carrying out the task. Besides, the feedback component must include not only the teacher's comments but also the student´s self and peer assessment if we aim to promote metacognition and self-regulation. (Panadero et al, 2019)

This perspective does not include as a task traditional test done on computers with automatic feedback. Such tests allow for the assessment of knowledge but given their decontextualized nature, can hardly be considered appropriate to assess competences that are enacted in an integrated and holistic manner, and in a specific context with a range of levels of achievement (Blanco, 2010; Bolivar, 2010). The assessment of digital competences requires the student to actively participate and produce (Blanco, 2010; Bolivar, 2010), taking technology into account.

The transition from practices and beliefs based on the assessment of knowledge to the assessment of competences requires the negotiation and discussion of concepts as well as the pertinence of this transformation. The discussion is supported by deep reflection on what is happening in formal education with the massive use of digital technologies especially after the pandemic Covid-19 crisis.

1.2. Reconfiguring Formative Assessment and Feedback

The dilemma between formative and summative views of assessment has persisted over the years, despite current guidelines in Portugal emphasizing the former. However, the existence of tests and examinations based on written tests in access to higher education has been an obstacle for teachers to

invest in innovative forms of assessment. In general, student assessment is associated with meeting the objectives of a subject or course and does not project the possibility of developing the ability to conduct assessment activities in the future (Boud, 2000). This author introduces the notion of sustainability in assessment, as an essential element in lifelong learning and therefore a domain of students and not just teachers. Sustainable assessment (Boud & Soller, 2016) is strongly supported by formative assessment that recognizes the importance of reflexivity and self-regulation supported by external and internal feedback, which facilitates students' self-assessment of their performances.

The reconfiguration of formative assessment and feedback within a model of self-regulated learning requires a transformation of practices and, above all, a change in beliefs and attitudes (Goertzen et al, 2023). In the regulation of learning, feedback provided by the teacher or by peers in co-evaluation is essential, as it allows for to reduce the divergence between the student's present understanding and what is expected (Hattie & Timperley, 2007). This process involves the student interpreting the feedback, and developing metacognitive self-regulation (Nicol, 2021; Nicol & Macfarlane-Dick, 2006).

In the implementation of formative assessment for complex, generic, or soft skills, the rubrics are powerful support (Rusman & Dirkx, 2017). They give cues to the student about what is expected in a task and allow for detailed feedback from the teacher, encouraging self-regulation of learning (Panadero et al., 2019; Panadero & Johnson, 2013). They are also important in peer feedback and assessment (Amendola & Miceli, 2018; Loureiro & Gomes, 2023) in which sharing ideas and evaluating each other's work with written or oral comments based on the criteria and expected performances that constitute the rubrics occurs. Constructing a rubric is a challenge that involves defining criteria appropriate to an assessment's purpose and describing these criteria across a continuum of performance levels (Brookhart, 2018).

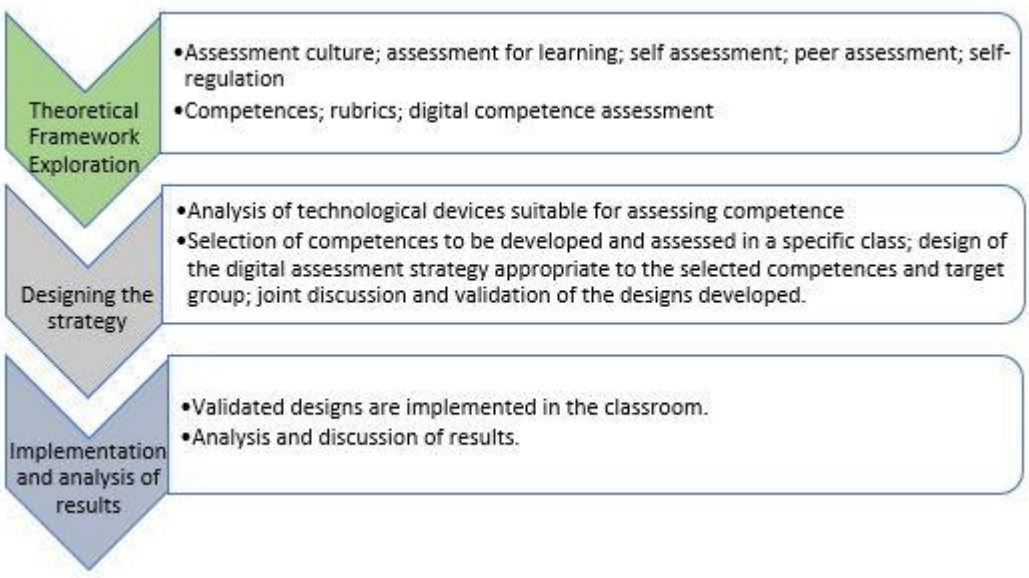
Rubrics are valuables tools to assess student productions such as oral presentations, essays, reports, research dossiers, portfolios, concept maps, teamwork, and videos.

2. METHOD

2.1. Learning design scenario

The course took place over six months, between November 2020 and April 2021. Starting from the analysis of the context- school, teaching level, curricula involved, and teachers' previous experience, namely in the use of technologies, a training and work path was outlined that culminated in the analysis of the results and reflection on the success of the evaluation strategies implemented (Figure 1).

Figure 1.
Learning scenario



Source: authors' elaboration

The course was designed as blended learning, but as were at the Covid19 pandemic, the whole course had to be adjusted to the limitations imposed. One of the changes made was to eliminate face-to-face sessions, replacing them with videoconference sessions (synchronous sessions).

All teachers were invited to discuss concepts based on documents provided by the trainers. For the exploration of technological devices, two sessions were held by videoconference, with a demonstration of their respective functionalities with a view to their possible use by the students. To provide more in-depth discussions, sharing of views, and mutual help, forum spaces were made available, using the Moodle platform. These allow for greater reflection because, being asynchronous, it is possible to extend them temporally.

For the design of the digital assessment strategies by the teachers, a model was proposed that focused on the competences being developed and assessed within the official guidelines. The choice of the technological device(s) was guided by the possibility of requiring the student's production within the school subject in question.

2.2. Participants

The study was carried out with a group of 12 Portuguese teachers of various subjects (Maths, Philosophy, Portuguese, Physics and Chemistry, English, among others) in primary and secondary education, including students from 7th to 12th grade, aged 12 to 17.

The authors participated simultaneously as researchers, trainers, and co-participants. We opted for a training process anchored in a horizontal relationship between researchers and teachers, seeking to define the contours of an innovative training course, aiming at the professional development of teachers.

The researchers therefore adopted an open attitude, putting up for discussion the concepts underlying the digital assessment of competences, seeking to provoke reflection and analysis on the choices made.

A flexible work plan was proposed, encouraging teachers to make decisions according to the context of their respective subjects, selecting the competences they felt met the official curriculum guidelines, designing the strategies to be implemented, building the necessary materials, choosing the instruments to analyse the results, and evaluating the strategies according to the data collected.

At the end, the teachers produced a final report (FR) describing the implementation process. In this final report (FR), the teachers described the strategy implemented, the resources and guidance provided to the students, as well as the results. The report also included a critical reflection on the process and the results.

2.3. Data collection and analysis

For this study, a qualitative perspective was favoured when analysing the data, considering all the asynchronous discussions and all the documents produced by the teachers. We analysed the interactions in the different forums and the final reports (FR) about the implementation of the strategies, using a spiral analytic approach (Creswell, 2007).

After creating records of all the virtual forums, the researchers analysed the documents individually, reading and rereading the transcripts. The contributions were first coded according to previous categories, in line with the conceptual framework: Competences, Feedback and Spaces. The final reports produced by the teachers were then subject to analysis based on this categorization.

Sequentially, a global analysis of the forums and the final reports was performed again by the researchers trying to detect themes and ideas that, although not classifiable in the categories already applied in the analysis, were presented as defining consistent thematic focuses in the analysed records. After this process, the researchers agreed on the themes that reflected similar ideas, grouping them. Three new categories emerged: Collaboration, Rubrics and Technologies.

Thus, the interventions in the forums and the reports were analysed based on the thematic categories created (Silverman, 2006), in a mixed deductive and inductive system, while triangulating the sources.

To protect the privacy of the participants, the data was anonymized, and the teachers' names were coded with the letter P followed by a number (e.g. P1).

3. RESULTS

The results are presented below, according to the categories of analysis.

3.1. Competences

The assessment of competences was therefore a challenge for the teachers. Prior to the development of strategies for the assessment of competences, a discussion was organized in a forum about the desirable competences for the 21st century, based on the analysis of official documents about the profile expected of the student at the end of compulsory education. In this discussion, we noticed a certain preoccupation with engaging students in the study of certain curricular contents, ignoring competences as a more complex construct that is difficult to operationalise.

> *This workshop was a challenge precisely because we were forced to think in terms of competencies, first, when we are used to revolving around content* (P2, Final Report, p. 3).

Based on the reflections that the documents provided led to, the debate unfolded around the role that the school could play in the development of competences and what each area of knowledge could bring to it.

> *The key competences are not only acquired in one discipline, as my colleagues have already said. Each subject contributes by developing the competencies that best suit the specificity of their subject (...) Another important competence is autonomy, which sometimes is not always developed in class.* (P11, Theme 2 Forum on key Competences).

> *Being a teacher of (.....), in a stricter sense, the main contributions of my area will be in the skills of critical thinking, reasoning and problem-solving, and well-being and health* (P 8, Theme 2 Forum key Competences).

The discussion that took place in this space was crucial for the teachers in the next step to feel more comfortable in selecting a restricted number of competencies that could be developed and assessed. Designing strategies according to the competencies to be developed was a critical point.

> *The fact that we are not used to devising strategies from competencies, but from contents, has sometimes made us hesitate, although this new formulation makes perfect sense* (P2, Final Report, p. 2).

The teachers found different ways of focusing the assessment on competences: i) in two cases they decided to propose to the students a work project common to several subjects, diversifying a little the competences to be assessed, ii) in another they considered it appropriate to focus on the same competences and design strategies that required the use of specific knowledge of the respective subjects, iii) a third group, sharing classes of younger students, decided to propose to the students the creation of a joint artifact, calling for the application of knowledge from different subjects.

Table 1 shows the competences chosen by the teachers to outline their strategies, considering the subject area and the year of schooling of the pupils concerned.

Table 1

Competences under evaluation

Competences	Subject areas	Years of schooling (Portuguese primary and secondary level)
Communication	Portuguese language	7th; 9th; 10th; 12th grades
	English; French	7th grade
	Natural Sciences	9th grade
	Biology-Geology	10th grade
Critical Thinking	Portuguese language	9th; 10th; 12th grades
	English	9th grade
	Natural Sciences	9th grade
	Biology-Geology	10th grade
	Philosophy; Geography	10th grade
Digital Literacy	Portuguese language	7th; 9th; 10th grades

	English	7th; 9th grades
	French; Mathematics	7th grade
	Natural Sciences	9th grade
	Biology-Geology	10th grade
Problem-Solving	Mathematics	7th; 12th grades
	Philosophy; Geography	10th grade
Teamwork	Portuguese language	7th; 9th; 12th grades
	English; French	7th grade
	Philosophy; Geography	10 grade
	Mathematics	12th grade
Creativity and Innovation	Portuguese language	12th grade
	Mathematics; English; French	7th grade

The following extracts attest to some decisions.

> *(...) reading different documents, different knowledge, searching for digital physical information, and expanding the repertoire of knowledge expressed in different literacies, to establish connections is a clear opportunity for the development of different competencies* (P1, Theme 2 Forum Key Competences, group 1).

> *We discussed the type of questions/problems we are going to propose, and we spent some time discussing how we were going to proceed with the assessment (processes/products) according to the selected competences: digital literacy, creativity and innovation and teamwork; languages work on communication and mathematics on problem-solving* (P9, Theme 2 Forum Key Competences - group 3).

3.2. Feedback

The implementation of the outlined strategies was carried out based on guiding documents provided to the students about the proposed activities and the criteria for evaluating them.

> *We built the work guide in sway. Tomorrow it will be presented to the students* (P1, Theme 4 Forum Reflection on practice).

> *After outlining my strategy, I made available, in the digital media, to the students a document with the guidelines (...). Throughout the process, I collected data to assess the students' performance and the implementation of the project, by analysing the publications submitted by the students on Padlet; simultaneously, I took the opportunity to provide feedback whenever it seemed pertinent or whenever requested* (P8, Final Report, p. 4).

The guidelines provided to the students were discussed, not only regarding the type of work but also about the evaluation with the rubrics.

> *The rubrics were discussed, and what would be assessed by the teachers (in my case, problem-solving) and the students (teamwork, creativity and innovation in self and hetero assessment) were negotiated*. (P1, Final Report, p. 2).

> *The rubrics were discussed with students for them to understand how they should regulate their learning, (...) One of the difficulties experienced by students was understanding the language used in the various performance descriptors and distinguishing the different levels* (P7, Final Report, p. 5).

As the activities were carried out, the teachers followed up on them, providing feedback, using various modalities.

> *This [Padlet] was an unknown tool for most students, so specific and regular guidance was needed (...) After overcoming the first obstacles, students started to publish data as they were building the project, which allowed (...) to follow, even remotely, the various stages of the project, guiding the groups, giving timely feedback, and allowing students from other groups to also share ideas among themselves (...)* (P5, Final Report, p. 3).

> *Feedback was given using talk and comment and sent through the Teams platform*. (P11, Final Report, p. 2).

> *Throughout the process students were given feedback based on rubrics about specific areas of performance, helping to identify strengths and weaknesses, which could guide students in the development of their work. (...).* (P7, FR, p. 5).

> *(...) I made the assessment rubrics available on the Teams platform (...), allowing each working group to make its learning regulation according to the defined criteria (...) the self-assessment presented by the working groups, and which was based on the rubrics previously published on the class wall confirmed that the students understood well the assessment criteria (...)* (P6, Final Report, p.3).

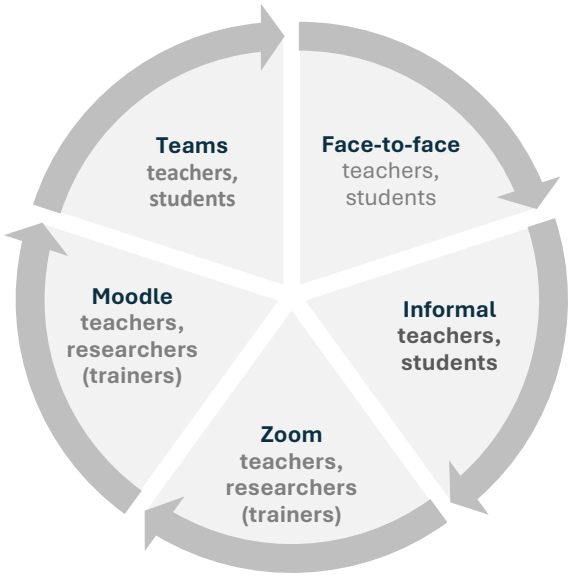
3.3. Spaces

As already mentioned, face-to-face sessions were replaced by meetings using videoconferencing. However, the face-to-face spaces continued to be work contexts. Teachers held face-to-face classes, complemented with activities carried out in asynchronous mode by students.

Face-to-face meetings between teachers to work collaboratively on the design of strategies were maintained regularly. The training process was fluid, with teachers moving between face-to-face and virtual spaces (Figure 2).

Figure 2

Diversity of spaces inhabited by teachers



Source: authors' elaboration

Teachers circulated between the face-to-face classroom and the school platform (Teams) to communicate and work with students. As far as training is concerned, they contacted synchronously with the trainers through Zoom, with an agreed schedule. The Moodle platform was used throughout as a space for work and discussion among the participants, including the trainers. Informal meetings were held in the school itself, and teachers also used virtual communication media, such as WhatsApp.

The virtual training spaces (synchronous and asynchronous) were adjusted to the needs felt. The unfolding of the spaces was requested so that teachers could focus on the discussion about the competences to be assessed, so forums were created for each group in Theme 2: *As agreed in today's session [videoconference], 4 forums for teamwork have already been organized (...); they are located at the end of the space dedicated to theme 2* (I/F1, Theme 1 Forum Culture of Assessment).

These forums were open to all participants, who joined the discussion in some cases, as observed when teachers from different groups exchanged ideas, mentioned below regarding technologies to explore:

> *In our group, we also decided to try Genially, the unpaid version allows sharing, as I was experimenting with a presentation I built. If you have any doubts, I can help you overcome this problem* (P 13, Forum Theme 2, group 1, in response to a colleague of this group who expressed some difficulties).

The classroom itself has become hybridised, combining synchronous and asynchronous virtual environments with the face-to-face environment, juxtaposing formal and non-formal workspaces between students, between students and teachers and between teachers themselves.

> (...) *I have made efforts to break the constant reluctance and personal constraints, to adopt digital environments, namely, the Teams platform, which has enabled synchronous and asynchronous virtual work with students (…), as well as the availability and sharing of all resources used in class and other useful resources for self-study, and for the students' delivery of assignments* (P4, Forum 2 Key Competences).

After some ideas exchanged in corridors, teachers' rooms and messages via WhatsApp, P6, P7, P4, P8 and I met virtually via Teams, defining the competencies that will be the basis of the project we intend to create within the proposed work (P5, Forum 2, Key Competences, group 2).

3.4. Collaboration

The teachers, being from the same institution and sharing classes, decided to design strategies that would allow students to relate knowledge, in an interdisciplinary perspective. Thus, they brought together several disciplines, or designed activities from a set of competences considered important for a given set of shared classes.

The forums related to the selection of competences to be assessed, those related to the elaboration of the strategies, and those focused on the data collection process were characterized by openness among the participants, in a frank dialogue, which is reflected in the number of interventions (see Table 1).

The exchange of ideas and points of view was constant, with emphasis on the sharing of documents and the discussion about them, which were often reformulated according to the trainer's questions or the comments of colleagues. The development of the strategies to be adopted and the creation of rubrics were also discussed, as well as the data to be collected to evaluate the strategies.

Table 2 shows the number of interventions in the forums, in each of the themes, and the respective period of occurrence. Some interventions are presented below.

Table 2

Number of messages in the asynchronous spaces

Forum	Number of posts	Period
Theme 1 – Assessment culture	41	4 Nov – 9 Dec
Theme 2 – Key competences **(4 forums - 1 generic and 4 forums per group)**	80	16 Nov – 15 Jan
Theme 3 – Forum Innovative Practices	61	7 Jan – 19 Jan
Theme 3 – Forum about rubrics	173	2 Feb – 17 Mar
Theme 4 – Reflection on Practice	74	15 Mar – 30 Ap

Source: authors' elaboration

The following is a short collection of messages that elucidate the collaboration between the participants.

After reading the various proposals from colleagues and teachers, here is my contribution to defining the criteria for assessing problem-solving competence in my area (P12, Theme 3 Forum about Rubrics).

This reformulation was born from the reflection provided by the exchange of ideas and the work developed with my group colleagues over the past week (P5, Theme 3, Forum Innovative Practices).

> *Following the exchange of messages on this topic and after group reflection, we decided to adjust the student satisfaction survey regarding the project, making it clearer and more comprehensive (...). It was applied to 9th-grade classes* (P8, Theme 4 Forum Reflection on Practice).

3.5. Rubrics

The development of rubrics for the assessment of the selected competencies proved to be difficult for the teachers, considering the definition of the appropriate criteria and the knowledge that the students should mobilize.

> *The rubrics generated a lot of discussion, and they continue to be one of the topics that we reflect on and try to improve. We have seen how difficult it is to generate a rubric that corresponds to what we want to evaluate. We realized how incipient our understanding of this subject is. We experienced difficulties in choosing the type of rubric (holistic or analytical) and in drafting the performance descriptors* (P 10, Final Report, p. 2).

If the construction of rubrics for the assessment of Teamwork did not reveal many disagreements between teachers. The same did not happen with the others, as in the case of Critical Thinking, which led to a heated debate (29 interventions). The concept of Critical Thinking was very much related to cognitive requirements within the teachers' subject area. The trainers' contribution to this debate (9 interventions), focused on the questioning of the difference between criteria and performances.

> *Considering what is essential in critical thinking (...), I suggest that the criteria should be based on: arguments, reasoning, and exemplification. In the descriptors, then, a more detailed statement would be elaborated... am I thinking wrong?* (P5, Theme 3, Forum about rubrics).

> *I believe that for the competence of critical thinking, in the field of philosophy and any disciplinary area, conceptualization, argumentation in favour of a personal position, and the justification of autonomous thinking are aspects to be developed (...) I leave my contribution to the discussion in the group (...)* (P12, Theme 3, Forum about rubrics).

Something similar was found in the case of the elaboration of rubrics for Problem-solving, with different understandings of the criteria among teachers of Mathematics, Philosophy, and Portuguese. In the case of communication competence, since several teachers were from the area, the discussion occurred fluidly.

3.6. Technologies

The previous year, due to the pandemic situation, the teachers had to familiarize themselves with the Microsoft platform used by the school, as well as the use of videoconferencing as part of emergency remote teaching. For the assessment, which focused on knowledge, they used Google Forms which allowed them to construct tests. At the beginning of the training course, there was almost unanimous concern about the use of technology to carry out the assessment, which was considered unreliable compared to the usual process in the face-to-face classroom. The exception was the use of videoconferencing to evaluate orality, which was mentioned by one of the teachers and considered a good option. Some opinions revealing this dissatisfaction are indicated.

> *I belong to a generation that did not grow up in front of a screen and, as such, tends to adhere very reluctantly to technologies* (P4, Final Report, p. 1).

> *Throughout E@D last school year, I felt the same discomfort that [...] mentions and that is related to the issue of accuracy and reliability in data collection activities for summative assessment* (P5 - Theme 1 Forum Assessment culture).

During the training, it was possible to extend the use of technologies, leading to the exploration and familiarization with other features previously minimized. The fieldwork itself imposed another perspective, that is, technology was naturally integrated into the process, not being an external device to the strategy.

> *We defined our digital strategy, in the logic of exploring the tools that the school provides and that had not yet been sufficiently explored. Channels were created in the teams for each team. In these channels, students could meet but should record in the "conversation" their research, contributions, deductions, and should discuss them among themselves, so that teachers could give feedback that would allow them to proceed to their self-regulation* (P2, Final Report, p. 4).

> *I was able to make contact for the first time with some tools (Genially, Kaizena, Wakelet, GitMind)* (P3, Final Report, p. 2).

It was also found, when implementing the strategies, that the students had to explore new devices, more in line with what they set out to do.

> *The difficulties felt [by the students] were mostly related to video editing (....) as they were forced to explore digital applications they did not know (Imovie, Inshot, Alight Motion, Filmora, among others* (P6, Final Report, p. 3).

> *After individual research and the exchange with teammates, we suggested to the students some video editing and sharing tools, such as Openshot, Vimeo or Shotcut. Some students added other options and solutions like Blender, iMovie or YouTube, making their choices according to the hardware they had available* (P5, Final Report, p. 3).

4. DISCUSSION AND CONCLUSION

The high number of interactions in the various forums reflects the richness of collaboration among peers and the opportunity for reflection on concepts, specifically assessment, self-regulated learning, peer assessment, feedback, competence, and rubric as well as the type of problems and tasks to be carried out, the competences to be developed and their assessment. An array of inter- and transdisciplinary and individual digital assessment strategies is emerging.

This prompts reflection on the influence that school contexts and teachers' experiences have on their motivation and engagement in new and challenging proposals. This corroborates the view of Boeskens et al (2020) on the importance of peer collaboration when it comes to innovative pedagogical interventions in real contexts.

In the discussion on the concept of competence, the intervention of the trainers was necessary several times to reorient the debate, since the teachers tended to consider only knowledge. Previous practice was based on finding ways to motivate and engage students in the acquisition of curriculum content.

Teachers were forced to reflect on the competences that involved mobilizing curriculum content to demonstrate the acquisition of these competences (authors, 2015; Cano García, 2008). This required a break from previous conceptions and practices, as pointed out by Goertzen et al (2023).

A particularly critical point was the definition of the criteria for each competence and their operationalization in terms of possible performances, essential aspects in the construction of a rubric (Brookhart, 2018). For these teachers, the construction of rubrics was a novelty, as they did not usually use them in their assessment practices. The discussion in the forum, initially dispersed, was conducted through the questions of peers and trainers, into the construction of rubrics related to the assessment of the competencies chosen.

Faced with the question of how to evaluate one's strategies the discussion was oriented around formative assessment, self-regulation, and peer assessment and feedback. These concepts were not new to the teachers, but in the discussion, it became clear that there were several myths resulting from their application. The theoretical precision and its clarification through the trainers' questions, as well as its implementation, were turning points in the teachers' perspectives and triggered innovative assessment practices.

The guidelines provided to students not only clarified the tasks to be performed but also presented the rubrics so that students knew the criteria by which they would be assessed, clarifying what was expected of them (Panadero et al., 2019). Teachers also used rubrics to provide feedback throughout the assignments, using a variety of modalities to help students assess the aspects in which they needed to improve, as recommended in the literature (Hattie & Timperley, 2007; Brooks et al, 2019).

For the implementation of the strategies, the learning spaces and digital tools were considered in the activities to be carried out with the students, i.e., which ones were available and most appropriate. Teachers accustomed to the physical classroom space had started remote emergency teaching using Teams. Some teachers had experience in using certain tools (e.g. Kahoot, Google Forms) but when others were needed, students were directed to ICT classes. The opportunity created by the course design made teachers open to new experiences with other technologies and reconfigure their assessment practices, becoming more proficient in using the digital.

There were different types of spaces, both in terms of communication between the participants and in terms of the practices carried out with the pupils. The existence of technological spaces that favoured collaborative work and learning was crucial: i) the forum, being asynchronous, allows flexible access over time, and structured as written communication, encourages reflection and openness to new points of view in the face of divergent opinions; ii) the synchronous space, by allowing all participants to be involved at the same time to discuss specific points, facilitates proximity between researchers and teachers; iii) the informal spaces used by teachers to quickly agree on ideas and details about particular aspects, such as WhatsApp.

The importance of combining virtual and physical spaces, formal and informal spaces was crucial, and these spaces were adopted according to the needs experienced.

As Akkerman and Bakker (2018) point out, the combination of different spaces and the collaboration between the participants was decisive for the adoption of new practices.

This study was guided by the following questions: i) What are the main challenges experienced by teachers in implementing digital assessment of competences? ii) What dimensions should be considered in a learning design scenario that promotes changes in teachers' digital assessment practices?

The main difficulties encountered in the digital assessment of competences were rooted in the concept of competence and how to select and operationalize the most appropriate competences for a given age level and scientific field.

Another critical issue was the application of rubrics, namely her creation and operationalising once defined the competences in assessment. Defining the criteria and choosing the statements that point to several levels of competence attainment was a big challenge.

These difficulties can be explained by practices in which the focus is more on teaching than on learning and where little value is placed on formative assessment to promote self-regulation and sustainable assessment.

Concerning the second question, the results point to the need to configure teacher training courses aimed at changing practices based on some fundamental dimensions. Firstly, to foster collaboration among participants, where they can benefit from open discussion about their practice, the conceptual underpinnings that will shape the adoption of new pathways, and shared experimentation with solutions in the field.

Secondly, considering the existence of different profiles in terms of digital literacy, also provides diversified situations for using technology, without imposing this or that device, thus gaining confidence in the selection of new technologies to incorporate into their assessment practice.

Thirdly, the results highlight the importance of teachers creating their pedagogical strategies and resources. Requiring teachers to design and implement digital assessment strategies during the training created conditions for sharing ideas and overcoming difficulties. It also fostered a reflective attitude towards practice, leading to sustainable change.

This study focused on changing practices in the digital assessment of competences. It has highlighted the challenges that teachers face when the focus of assessment shifts from a strict assessment of content to an assessment focused on the development of competences, taking advantage of the technological resources at their disposal. The results are promising, but there are limitations, not least the size of the sample, which does not allow them to be generalized.

It is necessary to replicate the course with other teachers, broadening the sample, particularly concerning the subject areas and other competences, to check the validity of the design's dimensions to develop digital competency assessment practices. On the other hand, sometime after the pandemic crisis, which forced teachers to use technology, it will be important to collect data from these teachers to ascertain the implications of the course on their teaching practice.

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