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MOVING ONLINE: Using the potencial of media for teaching and learning. A new pedagogy of learning contexts.

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Abstract: *Plenty of "disruptive" technologies have been introduced in society over the last decades while teaching remained static, but coronavirus has led to a rush of online teaching. The purpose of this article is to present the results of an **R**esearch - **A**ction – **C**ollaborative (R-A-C), in the context of higher education, carried out by a team of research professors from Instituto Superior de Tecnologias Avançadas (ISTEC), where one of the mandatory requirements is to have a certified teaching staff with pedagogical training for distance learning.This investigation aimed to answer the challenge / problem launched by the founding entity of ISTEC, of submitting an application to Agência de Avaliação e Acreditação do Ensino Superior (A3ES), for two new degree courses, in fully online, in the context of covid-19 pandemic. The qualitative methodology used in this research, carried out during the months of June, July and August 2020, by a collaborative team of 19 research professors, with descriptive analysis supported by the state of the art. Regarding the results, there was an effort in the research to gather contributions and pedagogical practices that can cover the specific needs of students enrolled in distance courses.*

Keywords: *Higher Education, Distance Learning, Design of Learning Context, Project-Based Learning (PBL), Open Educational Resources(OER), Rubrics*

1. Introduction

The main focus of this research is to analyze and evaluate the potential for integrating web technologies and OER in the pedagogical design of learning contexts and to create two undergraduate courses in the fully online modality, also obtaining the certification of the teachers responsible for co-construction and presentation of the respective application to A3ES.

The current teaching model was consolidated on the society standard of the 1st Industrial Revolution and, due to the lack of a new vision, it continues (continued) to be followed faithfully by the majority of teachers, despite the assumptions that support the current society of the Industry 4.0, be disruptively different. Although some teachers incorporate some technology in their classes, the pedagogies of explanation remain those that prevail, without anything essential changing in their pedagogical-didactic praxis!

The problem is that teachers are now under enormous pressure to be proficient in an environment that challenges their preconceived notions. Remote learning planning is challenging as it requires teachers to rethink many face-to-face processes that work effectively in a live classroom environment. Reinforcing the use of technology's potential to improve teaching capacity and to enlighten and challenge students intellectually was the purpose of this research.
With the pandemic, teachers were forced to make a remarkable effort to be able to teach from home, from one day to the next, trying to respond to the challenges that it posed in the academic context (and not only social and economic), of accompanying students. students,

give feedback on learning activities, promote collaboration and creativity and motivate them to learn, verifying that it is possible to teach without being in the same physical space, conceiving, for this, strategies and exploring pedagogically and technologically enriched environments so that the learning of the different themes / contents / key curricular concepts was successful.

2. Metodology

2.1 Methodological approach and strategy, the research problem and objectives

In this qualitative research, the methodology used was the approach to collaborative research-action (**R-A-C**) and the metacognitive strategy, learning by doing (Aleven, V., & Koedinger, KR, 2002) [1]. It was carried out during the months of June, July and August 2020, by a collaborative team of nineteen higher education teachers.

This investigation aimed to answer the challenge / problem launched by the founding entity of Instituto Superior de Tecnologias Avançadas (ISTEC), of submitting an application to Agência de Avaliação e Acreditação do Ensino Superior (A3ES), for two new degree courses, in fully online, in the context of covid-19 pandemic, where one of the mandatory requirements is to have a certified teaching staff with pedagogical training for distance learning. The priority of this R-A-C was encouraging teachers to formulate a new vision for distance learning share ideas, tips and suggestions about using multimedia for learning and use technology to create interactive, dynamic learning experiences.

The main objectives were:

a) to design of learning contexts online and encourage teachers to formulate a new vision for distance learning;
b) to analyze and evaluate the tools to engage online the learners and how to communicate the content, taking full advantage of the potential of technology to improve teaching ability and to intellectually enlighten and challenge students;
c) to discuss the ways in which multimedia technology and open educational resources (OER) can enhance the learning experience in online and blended courses;
d) to select the best technology-enhanced assessment strategies and interaction;
e) to create Rubrics, us a common method for evaluating student work, in terms of knowledge, skills and attitudes.

2.2 Following a path of innovation: research scenarios in higher education, participants and procedures

Aware of the degree of innovation required by this project, since in Portugal, only the Open University is accredited to teach courses completely online, and sharing the idea that for the success of the application, the individual professional knowledge of each professor / researcher on the team, it was not a sufficient condition, but rather only “knowledge transformed by the intersubjectivity of [different] professional groups and oriented to act in a situation” (Caria, 2013, p.15) [2], the know-how in action, and learning by doing, was mediated by attending two online courses, certified by the University of Texas at Arlington, “Pivoting to online. Research and Pratictioner Perspectives”, taught by a team of experts, such as George Siemens, Tanya Joosten, Matt Crosslin, Negin Mirriahi and Justin Dellinger, and another from the University of London, “Get Interactive: Pratical Teaching with Technology”, with the instructors Eilleen Kenedy, Sarah Sherman and Nancy Weitz.

The article results from the reflection produced in and for the action, within a research community, constituted by 19 higher education teachers, under the guidance / facilitation of the two course directors of the Computer Science and Multimedia Engineering courses, both accredited face-to-face operating regime, using the Microsoft Teams communication and collaboration platform.

2.3 Research questions

Based on the starting question: ***How to develop student-centric and interactive instructional online environments?*** The following research questions were enunciated:

Q1-Which Learning Management System (LMS) to choose for an online course?

Q2-What framework to adopt for design of learning contexts online?

Q3-How to improve constructivist/ cognitivist pedagogical practices through more active pedagogies and enriched with digital technologies?

Q4-How to choose the tools to engage online the learners?

Q5-How fostering interaction and student assessment?

3. Results

As a result of reviewing the bibliography and using content analysis of live sessions, discussion forums and shared practices with course participants and instructors, feedback received in carrying out the practical activities of the different modules, of the University of Texas and University of London courses, the results are presented giving the answers to the research questions.

Q1- How to create online courses?

An LMS is a tool that manages the processes of creating, hosting, distributing, and assessing training sessions. The tool allows trainers to host different types of training content. The most widely used Learning Management System (LMS) are: Moodle; Microsoft Teams and Blackboard Collaborate.

Q2- What framework to adopt for design of learning contexts online?

Figure 1 shows the Diana Laurillard's Conversational Framework (1993, 2002) [3], a model which respect the six types of learning, conditions necessary for learning to take place, derived from a synthesis of learning theories.

Figure 1: Six types of learning (Diana Laurillard's Conversational Framework, 1993, 2002) [3]
https://eileenkennedylearningtech.wordpress.com/learning-types-and-learning-techs/

Q3- How to improve constructivist / cognitivist pedagogical practices through more active pedagogies and enriched with digital technologies?

"Without taking away from the important role played by the teacher, it is helpful to remember that what the student does is actually more important in determining what is learned than what the teacher does" (Shuell,1986, p. 429) [4].

Actually the student-centred or "learner-centred" approach to teaching, instead of on what the teacher does, "lecture- centred ", represents a new paradigm and active learning approach to designing, implementing and reviewing how to teach (Thomas Shuell, 1986) [4].

3.1 Student-Centred Teaching *"vs"* Lecture - Centred Teaching

A student-centred approach focuses primarily on what the student needs to do in

order to learn, rather than on the course content or the transmission of information by the teacher. The course outline will set out the desired learning outcomes of the course, which in turn will be aligned with the exit proflie. The answer depends on the students themselves, the nature of the content, the learning activities planned to enable them to construct their own learning and the assessment and evaluation strategies.

New environments and startegies of assessment, envolves helping students to better regulate their learning through the use of effective learning techniques. Cognitive and educational psychologists have been developing and evaluating easy-to-use learning techniques that could help students achieve their learning goals.

Table 1: Teach and learn with web tools CoConqr

Lesson Plan	https://www.goconqr.com/mindmap/3914538/plano-de-aula-em-5-minutos
Educational resources for creating learning contents	ttps://www.goconqr.com/es/fichas/
	https://www.goconqr.com/slide/3355914/ensinando-com-as-ferramentas-goconqr?referred_by=library
	https://www.goconqr.com/pt-PT/library?subject_id=1549
	https://www.goconqr.com/slide/3403867/5-ferramentas-de-estudo-para-melhorar-sua-aprendizagem?referred_by=tags.study_aid

3.2 Project-Based Learning (PBL)

It is necessary to rethink the teaching work in a logic of project and collegiality.

Wurdinger (2016) [5] argues that PBL experiences can change lives when they lead to problems in the future and inspire students to discover new knowledge and develop skills and attitudes. Working on projects allows students to collaborate with classmates, take responsibility, communicate with members of the community, solve problems and, finally, learn how to learn. In this approach, the use of technologies is a natural process, as it is equally important that rethink teaching work in a logic of project and collegiality tudents are digitally competent.

For the Buck Institute for Education (2020) [6] an international reference on this methodology, there are seven essential phases of PBL, inserted in what they cal Gold Standard PBLEssential project elements, and which are listed below:

1. **Challenging Problem or Question** – The heart of a project – what it is "about," if one were to sum it up – is a problem to investigate and solve, or a question to explore and answer. It could be concrete (the school needs to do a better job of recycling waste) or abstract (deciding if and when war is justified). An engaging problem or question makes learning more meaningful for students.

2. **Sustained Inquiry** –To inquire is to seek information or to investigate – it's a more active, in-depth process than just "looking something up" in a book or online. The inquiry process takes time, which means a Gold Standard project lasts more than a few days. In PBL, inquiry is iterative; when confronted with a challenging problem or question, students ask questions, find resources to help answer them, then ask deeper questions – and the process repeats until a satisfactory solution or answer is developed.

3. **Authenticity -** In education, the concept has to do with how "real-world" the learning or the task is. Authenticity increases student motivation and learning. A project can be authentic in several ways, often in combination. It can have an authentic context, such as when students solve problems like those faced by people in the world outside of school

4. **Student Voice & Choice** – Students can have input and (some) control over many aspects of a project, from the questions they generate, to the resources they will use to find answers to their questions, to the tasks and roles they will take on a team members, to the products they will create. Student "voice" is somewhat different from "choice"--it means giving students the opportunity to speak in their own way, to express their own opinions, rather than speak in ways they think the teacher wants.

5**. Reflection** - Throughout a project, students – and the teacher – should reflect on what they're learning, how they're learning, and why they're learning. Reflection can occur informally, as part of classroom culture and dialogue, but should also be an explicit part of project journals, scheduled formative assessment, discussions at project checkpoints, and public presentations of student work.

6. **Critique & Revision** – Students should be taught how to give and receive constructive peer feedback that will improve project processes and products, guided by rubrics, models, and formal feedback/critique protocols. In addition to peers and teachers, outside adults and experts can also contribute to the critique process, bringing an authentic, real-world point of view. This common-sense acknowledgement of the importance of making student work and student products better is supported by research on the importance of "formative evaluation, " which not only means teachers giving feedback to students, but students evaluating the results of their learning.

7. **Public Product** - There are three major reasons for creating a public product and note that a "product": First motivation. Second, create a "learning community, where students and teachers discuss what is being learned, how it is learned, what are acceptable standards of performance, and how student performance can be made better.Third, "open school" When the public sees what high-quality products students can create, they're often surprised – and eager to see more.

The development of skills with regard to reasoning and problem solving; interpersonal relationship; information and communication; critical and creative thinking; personal development and autonomy; awareness and mastery of the body, scientific and technological knowledge, team work so fundamental for the job market. Competences that do not develop through the traditional teaching process, with exposure of concepts and application of written tests. "It needs to equip students with the skills they need to become active, responsible and engaged citizens" (OECD, 2018, p. 4) [7].

Trello is an example of tool for project planning: https://trello.com/

Q4 - How to choose the tools to engage online the lernears?

When choosing tools, two approaches can be used:

a) examples of learning outcomes, the kinds of learning activities that could achieve those outcomes, and how those activities could be supported by various learning technologies;

b) examples of the tools you may be interested in using and the types of activities and learning outcomes that are likely to be relevant.

To learn how to select technologies, in both situations, examples of learning outcomes, the kinds of learning activities that promote those outcomes, and how the activities could be supported by learning technologies, or examples of the tools you may be interested in using and looks at the types of activities and learning outcomes that are likely to be relevant, see the website: https://teaching.unsw.edu.au/selecting-technologies

The framework described by Bates & Poole (2003) [8] within the framework of cognitive psychology consisting of eight factors helps educators assess their selected technology before implementing it into their course design, to engage the learners:

S - students: Is the technology appropriate for the particular group or range of students? Will students be able to easily access the technology with their current computer devices (including mobile devices)? Will students continue to have access to their work on the online technology after the course has been completed (if this is important to you)?

E - ease of use: Will students need to take a lot of time to learn how to use the technology? Will I need to take a lot of time to learn how to use the technology? Am I comfortable enough with the technology to guide students if they have questions? If you answered 'no' to the last two questions, you may need to go to a training workshop (if available) or ask your colleagues for support. Or, if you don't currently have time to learn the technology, you may wish to select one that has a shorter learning curve or you are already familiar with.

C - costs: Will I or my students need to pay to access the technology? If so, you may wish to select a similar technology that is freely available either on the web or hosted by your organization. Are there licensing costs for archiving any of the course material after the life of the course (if it's required for you to maintain an archive of students' work)?

T - teaching and learning: Does the technology support the learning outcomes of my course? Does the technology engage students in their learning? Does the technology make my teaching more efficient (i.e. reduce marking time)?

I - interactivity: Does the technology support student-student, student-instructor, or student-content interaction?

O - organizational issues: Are there support structures to update and maintain the technology? Is there help or support available to me or the students if needed? Is there a way for me or my students to retrieve their material if the technology fails or is replaced? Will I need to manage students' accounts or login information or can they register and login to the technology themselves?

N - novelty: Will this technology provide a new learning experience for students? Will this technology help me advance my teaching approach? Have others used this technology for educational purposes? If so, can I learn from their challenges and success? If it's a relatively new technology, am I prepared if there are technical difficulties?

S - speed: Can I update content on the technology whenever I want to? Can I and my students quickly get setup to use the technology?

3.4 Improving Students' Learning With Effective Learning Techniques

Improving educational outcomes will require efforts on many fronts. One part of a solution envolves helping students to better regulate their learning through the use of effective learning techniques. The Table 2 summarizes ten learning techniques that could help students achieve their learning goals, according to the authores Dunlosky, J., Rawson, K.A., Marsh, E.J., Nathan, M.J., & Willingham, D.T. (2013) [9]

Table 2. Learning Techniques [9]

Technique	Description
1.Elaborative interrogation	Generating an explanation for why an explicitly stated fact or concept is true
2. Self-explanation	Explaining how new information is related to known information, or explaining steps taken
3. Summarization	Writing summaries (of various lengths) of to-be-learned texts
4.Highlighting/underlining	Marking potentially important portions of to-be-learned materials while reading
5. Keyword mnemonic	Using keywords and mental imagery to associate verbal materials
6. Imagery for text	Attempting to form mental images of text materials while reading or listening
7. Rereading	Restudying text material again after an initial reading
8. Practice testing	Self-testing or taking practice tests over to-be-learned material
9. Distributed practice	Implementing a schedule of practice that spreads out study activities over time
10. Interleaved practice	Implementing a schedule of practice that mixes different kinds of problems, or a schedule of study that mixes different kinds of material, within a single study session

Q5- How fostering interaction and student assessment? "How do I grade it?"

Integrate digital devices into your assessment plan only if adding them improves the quality of the student learning experience. Improving assessment management should be only a secondary consideration.

Learning and evaluating are indivisible facets of the same teaching-learning process. Assessing to improve learning, or assessing for learning or as learning is quite different from assessing learning. The use of digital tools in continuous assessment, such as e-portfolios, are examples of how it is possible to assess whether the learning objectives have been achieved by students, to know the process and the products, without using only face-to-face tests, the same for all.

Let us start with the distinction between formative assessment and sumative assessment:

Assessment is considered one of the most important goals in a student's learning journey. It provides both the teacher and the student with the opportunity to realise how well they have understood what they have learned. The Conversational Framework makes it clear that unless students have the opportunity to produce an output for the teacher to assess, whether or not it is graded, the teacher will not be in a position to know whether learning has taken place. For students, the prospect of grades and feedback can be a very motivating incentive for learning.

Feedback is the process by which the student receives detailed information about their submitted assessment. Assessment and Feedback processes have been widely explored over the last few years, including the ways technology can play an important role to support them -- for example, by facilitating automated and peer assessment.

Formative assessment is used to monitor student learning, give feedback and also to provide information that might lead to adjustments in teaching. Feedback is usually qualitative rather than scores or marks.

Summative assessment (Evaluation)is the type of assessment most people are aware of: this refers to the assessment that happens usually at the end of a term of learning and carries with it a score or mark. Summative assessment is designed to evaluate student performance. [10]

3.5 Selecting Assessment Technologies "How do I grade it?"

Planning and managing assessment using technology should ensure that it enhances learning

You can use it for **diagnostic assessment**, presenting low-stakes tasks that show students and teachers what students are ready for in terms of learning activities

Formative assessment activities (ungraded assessments that help students manage their learning) can also be presented online.

Graded, **summative assessments** (contributing to the final course grade) lend themselves to online presentation. Some tests can be partly or completely computer-marked; others allow students to review each other's work.

Table 3 summarizes a list of technology-enhanced that can be used in assessment strategies, but can be used also for learning.

Table 3: Web-based assessment technologies

Assessment strategies **Resources for engaging students with learning**	**https://teaching.unsw.edu.au/assessment-technologies** https://www.instagram.com/p/B-wf22Ggi8W/?hl=pt [11]
Quizzes	**https://quizizz.com**
Blogs **e-portfolios**	**https://teaching.unsw.edu.au/assessing-blogs** **https://wordpress.org/** **https://firebase.google.com/products/hosting/** **https://pt.wix.com/**
Discussion Boards	**https://teaching.unsw.edu.au/assessing-discussion-board**
Wikis	**https://teaching.unsw.edu.au/assessing-wikis**
Group Tasks	**https://teaching.unsw.edu.au/assessing-group-work**

Peer assessment of students	**https://help.twitter.com/en/using-twitter/twitter-polls**
Google Forms	**https://support.google.com/docs/answer/7032287?hl=pt-BR&ref_topic=9055304**

3.6 Pratical Assessment and evaluation: Web tools for assessment scenarios

Student feedback is vital in shaping and enhancing our teaching.

a) Edmodo (Assess student progress and performance with a follow-up bulletin)

c) Tellegami (discussion /collaboration, peer review)

d) Kahoot (diagnostic and formative assessment)

e) Piccolage (brainstorming /discussion with poster)

f) Quizzes (formative and summative assessment)

g) Google Forms (diagnostic, formative and summative assessment)

Weblogs e E-portfolios - The e-portfolio is based on a constructive view of learning and formative assessment, which is more authentic "because it demonstrates a direct link between teaching and the evidence presented in the portfolio" (Barton & Collins, 1993; Tillema, 1998) [12] participatory, since the evaluation is done jointly between the student / students / and the teacher, it continues and contextualized because it occurs as the students carry out the proposed work, and reflective because the students reflect, criticize and modify their work by collecting new ones knowledge.

.

3.7 Rubrics to Measure Student Learning

A rubric is typically an evaluation tool or set of guidelines used to promote the consistent application of learning expectations, learning objectives, or learning standards in the classroom, or to measure their attainment against a consistent set of criteria (UCN, 20017) [13].

By developing a pre-defined scheme for the evaluation process, the subjectivity involved in evaluating an essay becomes more objective. Scoring rubrics have become a common method for evaluating student work. Há different types of scoring rubrics, they are useful and provide a process for developing scoring rubrics. Scoring rubrics are descriptive scoring schemes that are developed by teachers or other evaluators to guide the analysis of the products or processes of students' efforts (Brookhart, 2005) [13a]. Attached are two examples of evaluation criteria and respective standards of performance.

Example 1: Rubrics for projetcs - **Annex 1**

Example 2: Evaluation Rubric and peer review for e-portfolios - **Annex 2**

3.7 Open Educational Resources (OER) and Creative Commons (CC)

It is necessary to take more advantage of the potential of the web when it moves from the physical space to the digital space (fully online), since students no longer have the teacher as their main resource.

Open educational resources (OER) - are teaching, learning, and research materials that are either (a) in the public domain or (b) licensed in a manner that provides everyone with free and perpetual permission to engage in the 5R activities. OER is one facet of open education, or efforts to make education more affordable, accessible, and effective—providing unfettered access to learning to as many people as possible.

Open education involves open practices, open policies, and open educational resources. OER enables educators to adapt learning resources to meet the needs of the growing populations of online learners, whether those needs are for translation into first languages.

Creative Commons (CC) is a global nonprofit organization dedicated to supporting an open and accessible Internet that is enriched with free knowledge and creative resources for people around the world to use, share and cultivate.

Different sites where OER and Creative Commons (CC) can be searched, https://search.creativecommons.org/

To avoid plagiarism, always respecting authorship and the creative process, it is necessary to know the terms of use of Creative Commons (CC), copyright and related rights https://creativecommons.org/about/cclicenses/ and the type of licenses and OER copyright duration https://www.nla.gov.au/how-long-does-copyright-last

Figure 2 illustrates the six different license types, listed from most to least permissive.

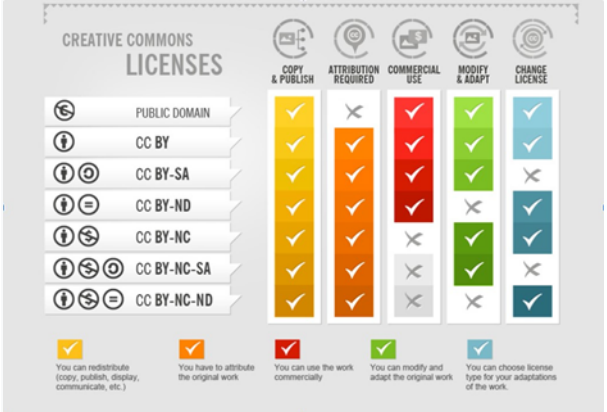

Figure 2- Creative Commons Licence

Examples of digital repositories and educational resources to engage students with learning:

Wikimedia Commons
https://commons.wikimedia.org/wiki/Main_Page

Creative Commons
https://pt.wikipedia.org/wiki/Creative_Commons

Creative Commons for Educaters
https://commons.wikimedia.org/wiki/File:Creative_Commons_for_Educators_and_Librarians.pdf

Gamification in Higher Education [14}
https://repositorioaberto.uab.pt/bitstream/10400.2/8257/1/ebookslead%2304.pdf
(This e-book is licensed under a Creative Commons License - CC-BY-NC-SA. Attribution 4.0 International.)

Cursos
Kan Academy - https://pt-pt.khanacademy.org/

Pictures - https://www.flickr.com/creativecommons/

Music
https://www.jamendo.com/legal/licenses?language=en

Files Multimedia
https://wiki.creativecommons.org/wiki/SpinXpress

Wikipedia multimedia repository
https://commons.wikimedia.org/wiki/Main_Page

Multimedia Educational Resource for Learning and Online Teaching (MERLOT)
http://www.merlot.org/

University of Leicester's OER Repository
http://www2.le.ac.uk/projects/oer

Jorum (Learning to Share)
https://store.jisc.ac.uk/home

OER Commons
http://www.oercommons.org/

There is also a Creative Commons search browser extension that we can use to find and creative commons and public domain work such as images

https://creativecommons.org/2020/01/06/cc-search-browser-extension/

There are also a number **toolkits** developed by the University of British Columbia that walk you through how to create your own media
http://diy.open.ubc.ca/toolkit-landing-page/

An integrated set of learning content creation tools, such as: Mind Maps, Flashcards, Quizzes, Notes, Slides
https://www.goconqr.com/pt

Mind Maps
https://www.goconqr.com/pt
PT/users/sign_up/step_3

Padlet
https://padlet.com

Others: SlidesShare, Slides do Google, Pinterest, Twitter Pools

Screenchat - Digital tools to enhance the recording of classes and share with students, videos with audio, using free software **Camstudio**
https://www.youtube.com/watch?v=Jh1cVh__uaE

Sociais networks that can instigate changes, too, in the way of teaching and learning: The use of **Twitter**, due to its specificities, should prioritize synchronous activities that allow interaction and organization of productions [15] The ten best ways to use this tool are (EDUCAREDE, 2009) [15a]:

> **1. Notice board**: communicate to students changes in course content, times, places or other important information.
>
> **2. Summary:** ask students to read a text and summarize the results main points, with a limit of 140 characters.
>
> **3. Share sites**: periodically, each student is committed to share an interesting new site you've met on the web.
>
> **4. Twitter on the prowl**: follow a famous person and document your trajectory.
>
> **5.Twit * in other times**: elect an important character in the history of civilization or his country and create a Twitter account for him. In a given time, write on Twitter like this character, with style and vocabulary of the time, wondering what he would say.
>
> **6.Micro meetings**: to hold conversations in which all students who participate subscribe to Twitter.
>
> **7.Microtexts**: progressive and collaborative writing to create micro-stories.
>
> **8.Language of Twitte**r: **send twits** * in foreign languages and ask students respond in the same language or translate twit * into their native language.
>
> **9.Text stream**: start a meme * so that all content created can be automatically captured by an aggregator *.
>
> **10.Cultural exchange**: encouraging students to find a tweeter * of another city, state or country and regularly talk with him for a period time to get to know your culture, your interests, friends, family. Ideal for learn about other cultures.

4. Discussão

Para Tom Daccord (2020) [16]

> A silver lining of this global pandemic is the huge opportunity it provides to rethink the student learning process. That said, if pedagogical innovation occurs at all, it likely won't happen right away. Innovation in instructional practice can only take place if educators are willing to accept a fundamental change in the student-teacher dynamic. That remains to be seen. [16]

In times of pandemic, when face-to-face classes were suspended and replaced by distance classes, the solution to this problem became an emergency for all teachers and the need was accelerated due to the confinement caused by COVID-19, which forced professionals teaching, to integrate digital educational resources and various tools available on the Web in their classes, and move from classroom teaching, traditionally transmissive, to online teaching, centered on each student.

One of the guiding principles of the General Directorate of Higher Education (DGES), for 2020/21, for higher education institutions, is that the priority of creating opportunities to stimulate innovation and pedagogical modernization must be reinforced and as an operational recommendation, that these create conditions for the promotion, experimentation and dissemination of innovative teaching and learning practices, which allow Portugal to continue to be considered by the European Commission as a "strongly

innovative" country, as it was in the 2020 edition of the European Innovation Scoreboard (EIS 2020) and that the educational offer is adapted to the different population segments, in order to guarantee reaching the goal of having 20 year olds studying in higher education increase from the current 50% to 60% by 2030.

Mobile devices have allowed students to follow classes synchronously through videoconferences, supported by services such as Zoom, Google Meet, Microsoft Teams, among others. We currently have a variety of applications to record classes, propose synchronous or asynchronous online activities, test knowledge (such as quizzes with correction and immediate feedback), as well as forms (Google Forms) that allow teachers to keep track of the tasks that students are developing and even texts they are writing, individually or collaboratively.

There are several platforms on the Web (EdPuzzle, Animoto, Memoov, Stupeflix, PhotoPeach, WeVideo or Masher) that allow the creation of videos and interactive presentations that can help enhance the study of a certain contente.

The methodological procedures used in this collaborative investigation allowed us to recognize the importance of technology for the construction of new learning, build collaborative learning activities that allow students to be envolved in interaction with their colleagues and the teacher, promoting collaborative learning, interactivity and conversation and competency-based, formative and collaborative assessment and raising awareness of the importance of creating open digital badges, through the use active teaching mediation online.

5. Conclusions

5.1 Overall Conclusion

Reflect on teaching performance in a reasoned, self-critical and shared way, through reflective professional experiences among peers. Teachers quickly recognized with this investigation that students cannot be expected to spend hours in a videoconference room.

This investigation, througt an updated review of the state of the art on the topic under study, reinforced and made the teachers participating aware that they were looking for a practical introduction to teaching with technology, recognize the need for:

i) to change the design of learning contexts, namely, make use of technology to create interactive and dynamic learning experiences, acquiring a new bag of resources to teach and make learning;

ii) to change or reformulate the evaluation criteria and formulate the objectives in terms of essential learning, taking into account not only knowledge, but also capacities and attitudes;

iii) teachers rethought instructional models and explored unifying student-centered frameworks, that foster inquiry, independence, problem solving and creativity in a remote setting. For instance, problem-based projects that are designed to last several days and weeks can be completed by students remotely and independently, thanks to collaboration technologies;

iv) the use of web technologies enhances a multiplicity of approaches to the designer of online courses.

v) without a new pedagogical vision, teachers are unlikely to adopt a new mindset.

vi) That professional knowledge necessarily implies the "transformation of knowledge possessed- acquired, learned, experienced in other places or in social trajectories, today very individualized- in a knowledge shared with others in the interaction, in order to be able to act in a certain context" - tradução livre de "transformação do saber possuído- adquirido, aprendido, experienciado

noutros lugares ou em trajetórias socias, hoje muito individualizadas- num saber partilhado com os outros na interação, para se poder agir num determinado contexto" (Carina, 2013, p.15). [2]

This collaborative experience, among peers, mediated by experts in change and complexity in learning, learning innovation, distance education and digital learning, emphasized academic discussion and reflection and allowed to rethink and get some guidelines / hints for the design of new learning contexts - planning and design environmments, selecting teaching and learning technologies, supporting students needs and perspectives and giving constructive and real-time feedback to students, fostering online interaction, practical assessment and evaluation- with an impact on the application submitted to the two new distance undergraduate courses.

5.2 Contributions of this research and recommendations for future studies

The expected contributions with the publication of this research are to stimulate the experimentation and dissemination of innovative pedagogical practices, deepening new ways of teaching and learning, namely project-based (PBL), integrating inclusive forms of self-learning and self-regulation and team work online, and promote the debate on this topic, in professional and social network of scientific research and in teaching.

In sum, when we are willing to work with digital resources, we need to make efforts to appropriate their distinctive characteristics, the need for further research to establish and as António Dias de Figueiredo (2016) [17] argues, it is our belief that the pedagogy of learning contexts will be a central theme of collaborative research of pedagogical practice and learning in the 21st century, which requires from each teacher, creator and manager of learning contexts, continuous training inherent to the performance of their teaching profession, without forgetting the three dimensions: teaching, knowledge production and social presence (Educational Community of Inquiry (CoI), Marti Cleveland) [18] that help us rethink alternatives, due to the ever new challenges of the daily life of the current society that is guided by the volatility of technologies, the uncertainty of pedagogical theories, the complexity and ambiguity of the different situations, not preventing us from imagining another, more humanistic future, reimagining education and form tion to transform school and teaching (Xavier Aragaay, 2017)[19]

Following the organizational philosophy of RAC, which develops in spiral cycles of increasing complexity, it is now necessary to continue monitoring the process for. understand whether the set of changes / innovations assumed by teachers in this training had an impact on organizational and professional development.

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Annex 1- Example 1: Rubrics for projetcs

	LIST OF ITENS Performance level descriptors
Analysis & Research	i) All resources are properly documented with both citations and bibliography; notes are presented and well formatted; ii) Attention to quality of resources is apparent; iii) There is a variety of sources and most recent and valuables sources are used and analysed; iv) People resources are a main part of the work produced. v) students got beyond the analysis of current state of the art by performing interviews with experts of the field.
Objectives & Documentation & Presentation	i) Student addressed all areas of project proposal thoroughly, specifically meeting stated goals. ii) All standards mentioned in proposal well addressed the project. iii) Project purpose is made very clear and list of objectives is well defined. iv) Student meets goals defined for the project. v) Report is well organised (introduction, body and conclusion), structured and transition between topics logically flow; vi) Support material such as images and videos are relevant and appropriate; vii) Presentation is clear and well structured, performer is confident; viii) All members of the group participate in thedelivery of the Report and Presentation.
Design & Implementation	i)Professional quality product: shows originality, creativity, and in-depth study; ii) Student generate down idea iii)There is proof of feedback from experts iv)Product is delivered to a specific audience in the real world. v) Implementation stages and description are explained in detail to the point thatsomeone else could replicate the work.
Reasoning Conclusions & Results	i) Easily convey the point of the topic. Vocabulary is easy to understand, and all words are spoken in a clear and fluent manner. ii) Evaluation and validation of results are well illustrated and demonstrated; iii) Connections between facts and theories, critical evaluation of evidence; iv) Separation of facts from opinions, consideration of alternative viewpoints; v) Constructive outcomes analysis and ability to apply the learned topic beyond the current state of the art study

Annex 2- Example 2: Evaluation Rubric and peer review for e-portfolios

Read carefully the following criteria for evaluatin the e-portfolios, and complete the table with an "X" in the box that best represente the quality of the work. Send it to my mail on the day of Project Presentation, one rubric for student.

1-Insuficient work (Poor)
2-OK work
3-Good work
4-Great work
5-Comments: In one sentence justify your selection

Name of Sudent:
Course & Year:
Student ID:
Projet Name:

Evaluation criteria for e-portfolios	**1**	**2**	**3**	**4**	**5** Comments
Organization 1. Creativity 2. **Mandatory items** 2.1. Presentation (personal; academic; professional). 2.2 Why use the e-					

portfolio in the HCT unit? 2.3 Learning Evidences 2.4 Reflective Report 2.5 Social Contacts					
Quality of works 1. Layout. He always respected the layout of the works - word, power point, vídeo, article? 2.Wrote references of bibliography and webgraphy according to APA Norms (6th edition) and according to the IEEE Standards in the article? 3. He made a significant and innovative narrative in the research work? He did not plagiarize? In the article he respected the different parts: Abstract; Introduction; Theoretical Framework / State of the Art; The Case Studies; Conclusions; References?					
Oral Presentation of the e-portfolio 1.The reflective report clearly highlights the process of developing student learning in the HCT unit? 2. Did you take into account the learning objectives expected at the HCT unit and the student's initial commitment when opting for continuous assessment? 3. Presentation is clear and well structured? 4. Performer is confidente? 3.Had a good diction? 4.Managed time weel?					
Number of works 1.Did all the work? 2. Didn't do all the work?					
Which was the your/ your colleague main take away of this project _____ _____					