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# Academic perspectives of the teaching-research nexus in initial teacher education in Portugal

## *Perspectivas académicas del nexo enseñanza-investigación en la formación inicial del profesorado en Portugal*

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**ABSTRACT**

For future teachers to be researchers of their teaching practice, and to improve it, it is important to enhance a strong relationship between teaching and research during their education. Based on this idea, a study was carried out with the aim of widening the debate about the teaching-research connection in higher education or, as it is called by some authors, the teaching-research nexus. The research study answers the following questions: What positions justify the importance of the teaching-research relationship in initial teacher education? What is the manner of this relationship in initial teacher education?

What difficulties and possibilities are there for conducting teaching with research? Methodologically, an email internet interview with three open-ended questions was used to collect the opinions of professors who provide initial teacher education. The interview protocol was submitted to critical validation using the "jury agreement" technique and was answered by 56 professors of 13 higher education institutions from the 24 that provide initial teacher education in Portugal. The professors were informed that the overall data and institution names to which they belong would be anonymized. The answers given were submitted to content analysis supported by Healey's (2005) typology of the teaching-research nexus: *research-led teaching; research-oriented teaching; research-tutored; research-based teaching*. This analysis allows the conclusion that, when referring to the teaching-research relationship, the professors present concepts related to the four dimensions spelled out by Healey, although a research-oriented approach was favoured. Institutional and educational policy reasons were pointed out as the greatest difficulties in achieving teaching with research, even though also possibilities were identified to lead this change. This situation opens perspectives for initial teacher education to prepare future teachers to guide their curricular practices supported by research. To this end, it is important to invest in institutional cultures and in the working conditions of higher education professors.

**Keywords:** initial teacher education, higher education, teaching-research nexus, teacher-researchers

## RESUMEN

Con el propósito de que los futuros profesores sean investigadores de su práctica docente y puedan mejorarla, es importante potenciar una fuerte relación entre la enseñanza y la investigación durante su formación. Partiendo de esta idea, se ha desarrollado un estudio que pretende ampliar el debate sobre la conexión docencia-investigación en la enseñanza superior o, como lo denominan algunos autores, nexo docencia-investigación. El presente estudio de investigación responde a las siguientes preguntas: ¿Qué posturas justifican la importancia de la relación docencia-investigación en la formación inicial del profesorado? ¿Cómo es esta relación en la formación inicial del profesorado? ¿Qué dificultades y posibilidades existen para llevar a cabo la enseñanza con la investigación? Metodológicamente, se utilizó un cuestionario, a través de correo electrónico, con tres preguntas abiertas para recopilar las opiniones de los profesores que imparten formación inicial del profesorado. El cuestionario fue sometido a una validación crítica mediante la técnica del "acuerdo del jurado" y fue respondido por 56 profesores de 13 instituciones de enseñanza superior de las 24 que, en Portugal, imparten formación inicial del profesorado. Los profesores fueron informados de que los datos globales y los nombres de las instituciones a las que pertenecen serían anónimos. Las respuestas dadas fueron sometidas a un análisis de contenido apoyado en la tipología de Healey (2005) sobre el nexo enseñanza-investigación: *enseñanza dirigida mediante investigación; enseñanza orientada a la investigación; investigación tutelada; enseñanza basada en la investigación*. Este análisis permite concluir que, al referirse a la relación docencia-investigación, los profesores presentan conceptos

relacionados con las cuatro dimensiones enunciadas por Healey, aunque se favoreció un enfoque orientado a la investigación. Las razones de política institucional y educativa fueron señaladas como las mayores dificultades para lograr la enseñanza con investigación, aunque también existen posibilidades de liderar este cambio. Esta situación abre perspectivas para la formación inicial que prepare a los futuros docentes para prácticas curriculares apoyadas en la investigación. Para ello, es importante invertir en las culturas institucionales y en las condiciones de trabajo de los docentes de la educación superior.

**Palabras clave:** formación inicial del profesorado, educación superior, nexo entre enseñanza e investigación, profesores-investigadores

## INTRODUCTION

In the last century, Stenhouse (1987), associating the idea that educational improvement is related to involvement with research, stated that the knowledge produced provides the necessary conditions to introduce changes to improve processes. Currently, the day-to-day situation of schools is complex, and much is expected of teachers in the development of curricular practices that positively respond to the diversity of students' circumstances. It is thus important to ensure opportunities in initial teacher education courses for students/future teachers to encounter real situations and investigate what occurs in them (Grossman & McDonald, 2008; Nóvoa, 2019).

Training teachers in which research is used to teach has advantages because: it provides the necessary conditions to monitor the quality of teaching practices; it promotes reflection on the effects of these practices; and it allows the construction of knowledge to be mobilized in the continuous improvement of teaching-learning processes, that is, one learns from research on practice (Böttcher-Oschmann et al., 2021; McCartney et al., 2018; Obwegeser & Papadopoulos, 2016).

In Portugal, related to the Bologna Process, the initial training of teachers has been obtained with a master's degree since 2007. To access the master's degrees that qualify teachers for the 7th to the 12th school year, candidates must have completed graduation (first Bologna cycle with three years), in which students acquire knowledge focused on a special content (mathematics, biology, etc.). Therefore, in this case, it is only during the master's degree that students/future teachers come into contact with professional situations related to school education and teaching practice. In the case of a master's that prepares them for teaching in the first six years of schooling, candidates must have completed a degree whose curricular plan already includes some contact with schools and some initiation into teaching practice. The teacher training courses referred to in this article must contain different education areas in their curriculum: specific teaching areas and their didactics; general education subjects; initiation to professional practice and

supervised teaching practice; and issues related to the cultural, social, and ethical dimensions of the teaching profession.

In initial teacher education courses, the teaching-research relationship can prepare future teachers to build their teaching practices supported by research. In line with this idea, a study was conducted with research *loci* of higher education institutions (HEIs) providing initial teacher education courses in Portugal. This study thus contributes to the production of knowledge to improve initial teacher training courses. A sample of professors responsible for teacher education in Portugal were asked to answer the following research questions: What positions justify the importance of the teaching-research relationship in initial teacher education? What is the manner of this relationship in initial teacher education? What difficulties and possibilities are there for conducting teaching with research?

From an empirical point of view, the study followed a qualitative interpretation (Creswell & Creswell, 2018), collecting data through an email internet interview with three open-ended questions. The data correspond to the opinions of professors who provide initial teacher education in higher education institutions of the university and polytechnic subsystems in Portugal.

## THEORETICAL BACKGROUND

Some studies pointed out that to fulfill its mission, higher education must work in line with an educational profile in which research and teaching are strongly interconnected (Afdal & Spernes, 2018; Elsen et al., 2009; Fung, 2017). Related to the importance of curricular practices supported by the teaching-research relationship, some authors (Griffiths, 2004; Healey, 2005; Healey & Jenkins, 2006; Simons & Elen, 2007; Stappenbelt, 2013; Taylor, 2007; Wood, 2009) state that this relationship constitutes a nexus and others consider the parts as inseparable (Leite, 2019; Brew, 2010; Fanny Chan Fong Yee, 2014; Willcoxson et al., 2011).

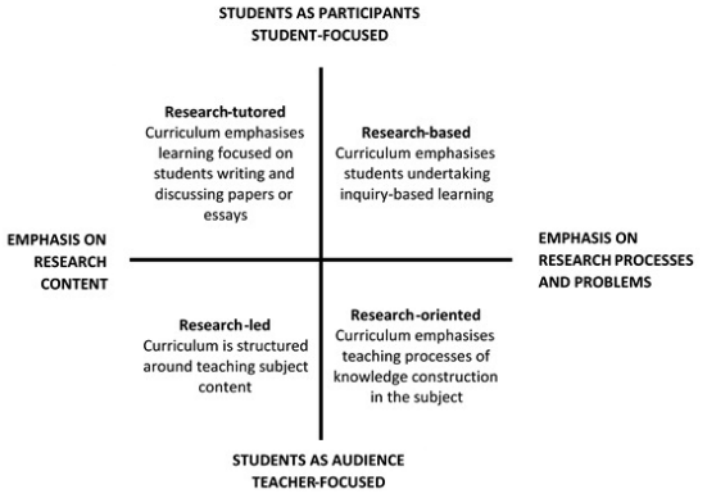
Focusing on the teaching-research nexus, Healey (2005) referred to the existence of four possibilities. A first possibility represents *research-led teaching*, that is, teaching that is based on the research conducted by the teacher, in which the students are mere recipients of the knowledge that is transmitted to them and that has been produced by others. A second possible relationship, called *research-oriented teaching*, exists, in which professors teach by presenting students with research processes, so they can learn about research methodologies. The third type of relationship, *research-tutored*, is that in which students are organized in small groups and, under the supervision of the professor acting as a tutor, have the opportunity to carry out research and write articles systematizing student's results they have conducted. Regarding the fourth possibility proposed by Healey (2005), called *research-based teaching*, students also assume the role of researchers by

defining research questions, debating and planning procedures, collecting data, and interpreting them according to the frameworks that they are searching for. It is a type of teaching-research relationship based on strong interactions between professors and students, characterized by the horizontality that accompanies the idea of a collective researcher, because it recognizes and accepts that both professors and students can teach and learn.

Figure 1 represents these four types of teaching-research relationships, using the level of student participation and the emphasis that is given to research as a reference. As the figure shows, the four-quadrant schema of the research-teaching nexus reflects different links, and analysis of it can support strategic options based on greater or lesser student participation. When the focus is on student participation and research, the teaching-research nexus is included in the concept of what Healey (2005) calls *research-based teaching*. In this procedure, professors and students are involved, collectively and committedly, in teaching and learning through the research they carry out through processes of problematization, data collection, data interpretation, sharing, and comparing points of view.

**Figure 1**

*Curriculum design and the research-teaching nexus*




*Fuente*. Healey (2005, p. 70).

However, Healey and Jenkins (2006) recalled that "often the most effective learning experiences involve a combination of all four approaches" although "the emphasis should be placed on the student-cantered approaches in the top half" (p. 48).

In line with these ideas and adhering to arguments that indicate the advantages of a strong teaching-research relationship in higher education, a study was made focused on what occurs specifically in initial teacher education courses. These courses were selected as the focus because they prepare students to be teachers, expecting them to follow *research-based teaching*. Also in this specific case of initial teacher education, the teaching-research nexus is important because it is an essential dimension for the professional development of teachers, contributing to the improvement of their professional practices and the status of the teaching profession (Sousa et al., 2020).

From this perspective, integration of research components in teacher education programs has become an international trend to prepare teacher-researchers who are capable of mobilizing knowledge produced in processes of reflection that foster improvement in teaching practices (Brew & Saunders, 2020).

Participation in research activities appears to be a useful and beneficial strategy to develop competencies in students/future teachers and for professional development (Guilbert et al., 2016). It is in this sense that some authors (Agud & Ion, 2019; Oolbekkink-Marchand et al., 2020) reinforce the importance of preparing students/future teachers not only to consume research but also to produce it. In line with Damşa (2018) and Gutman (2021), providing students/future teachers with research activities linked to practice favors the construction of knowledge derived from research, so that it is integrated into teaching practices. It also enhances the development of a critical view of teaching practice and promotes a reflective attitude and an open mind to opportunities for professional empowerment (Katwijk et al., 2019; Perines, 2020).

Even though the importance of the teaching-research nexus in higher education is recognized, namely particularly in initial teacher education, this relationship seems to be scarce in the practices that produces discourse that refers to it (Bovill & Felten, 2016; Elsen et al., 2009; Walkington, 2015). It is in the desire to overcome this situation that some authors (Jenkins & Healey, 2005, Jenkins et al., 2007; Khan, 2017) mention the need to foster both its conceptual and practical levels and understand its importance and possibilities. It was also in this sense that the study referred to in this article was carried out.

## METHODOLOGY

The study used a qualitative approach (Creswell & Creswell, 2018) and involved 56 professors of 13 HEI (six from the university subsystem and seven from the polytechnic subsystem) from the 24 that provide ITE in Portugal. The selection of these professors followed intentional convenience sampling criteria of the HEIs in Portugal that have had most influence on initial teacher education. In each HEI, the

course coordinators and teachers who teach subjects with a higher number of ECTS (European Credit Transfer System) were contacted. An email internet interview was used to collect the opinions of professors who responded positively to the invitation to participate in the study. They were informed that the overall data, after the processing and anonymization of the responses and institutions to which they belong, would be returned to them. The interview contained three open-ended questions: i) In initial teacher education, what importance do you attribute to teaching with research?; ii) What are the difficulties in conducting teaching with research?; iii) What are the possibilities for conducting teaching with research, specifically in initial teacher education? To ensure the critical validation (Boa et al., 2018) of the interview protocol, it was subjected to the "jury agreement" technique. For this, an analysis was requested from two academics with relevant knowledge and experience in the study topic.

The discourse was interpreted by the content analysis technique (Elo et al., 2014) and, supported by Healey's (2005) typology, allowed the identification of categories and their greater or lesser prominence.

## DATA PRESENTATION

Almost all the teachers questioned (54/56) answered the question "In initial teacher education, what importance do you attribute to teaching with research?", indicating that they consider it very important and using expressions such as: "it is fundamental"; "very relevant"; "of crucial importance"; "maximum importance"; or "total importance." Nevertheless, two professors considered it unimportant, providing the following arguments:

> I believe the obsession with research distorts the aim of working toward the development of an educator/professor.
>
> Teaching with research requires another kind of organization of the study plans and modes of teaching which, in my opinion, does not exist.

All the other 54 responses indicated reasons why they consider teaching with research important. An analysis of these references allows identification of the meanings of the relationship these professors establish between teaching and research, and with Healey's (2005) typology. Of the total 83 references presented, 27 points to *research-oriented teaching*; 22 to *research-tutored teaching*; 19 points to *research-led teaching*; and 15 to *research-based teaching*.

Examples of arguments that point to a teaching-research relationship in line with *research-oriented teaching* (27), in which the professors are responsible for teaching and presenting research processes to the students so they understand different methodologies, were mentioned:

> The education of teaching professionals, specifically teachers, should include a subject that includes research knowledge.
>
> To have teaching with research, I believe there needs to be a research methodology curricular unit and work on scientific research articles.
>
> Teaching with research should allow both the mastery of instruments and procedures, as well as their theoretical and conceptual meaning.

Other arguments (19) point to a teaching-research relationship related to the presentation of research done by professors or by other academics so it can be understood by students. In other words, this is what Healey (2005) called *research-led teaching*. Interviewed commented:

> Bring the research into the classroom and show them what is being researched in the field.
>
> Sharing with the students the research that is being conducted in the respective institutions.
>
> Initial teacher education must benefit from the research outcomes that are being produced by the teachers themselves in their research agenda.

Related to *research-tutored teaching* practices, 22 references were presented, which may be because initial teacher education courses in Portugal include curricular units on initiation to professional practice in which students are organized in small groups, under the supervision of tutors. This supervision is similar to what Healey (2005) considered *tutored research teaching*. Maybe, for this reason, 21 of the 22 references were associated with these curricular units. The respondents stated:

> In the case of initial teacher education, curricular units such as didactics and initiation to professional practice are the most favoured contexts to conduct properly supervised research on a didactic-pedagogical topic in a school environment.
>
> In initial teacher education, there are curricular units that can foster teaching with research, such as professional practice.

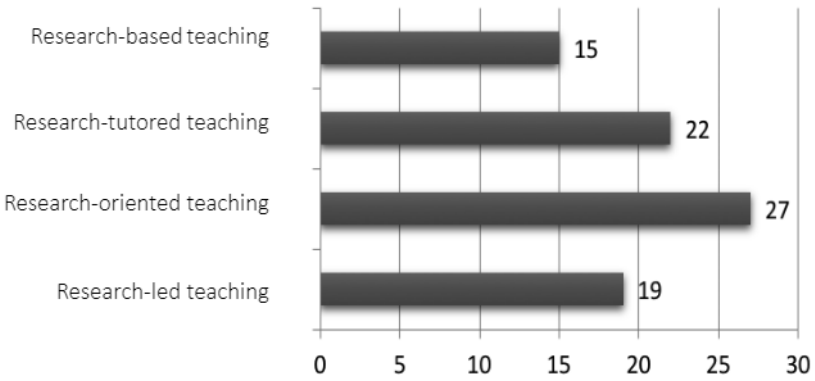
As for the *research-based teaching* orientation mentioned by Healey (2005), 15 arguments were presented strongly associating teaching processes with research under the logic of action research. As mentioned before, in this orientation students take on the role of researchers by asking research questions, debating and planning procedures, collecting data, and interpreting it according to analysis frameworks they search and share. Among other arguments, the respondents mentioned:

> In supervised teaching practice, the research dimension is a mandatory component and students must choose a research topic related to their practice, usually constituting action-research processes.
>
> Initial teacher education, among many other things, aims to contribute to the training of insightful teachers who, above all, learn to research their practice in a cycle of constant action research.
>
> Research must be an integral and structural part of the initial education of future teachers; it is what makes it possible to address problems and processes, understandably and dynamically, and allows one to experience the importance of developing an investigative and evolutionary attitude toward knowledge.

In sum, the arguments presented and systematized in Graph 1 allow the conclusion that *research-oriented teaching* is the dimension most mentioned by these professors when they refer to the importance of the teaching-research relationship. This dimension is followed by *research-tutored teaching* and *research-led teaching*. *Research-based teaching* is the least mentioned dimension, with 15 references.

**Graph 1**

*Distribution of the references about the importance assigned to teaching with research*




In the interpretation of these data, Healey and Jenkins' (2006) conclusions cannot be ignored, that is, the teaching-research relationship is achieved by a combination of all four approaches. For this reason, in the study we are referring to, all the professors' references were counted, and not just the number of professors.

Related to the answers to the question "What are the difficulties in conducting teaching with research?", the 56 respondents who answered this question listed 132 difficulties, organized around three emerging categories: 72 of which were difficulties due to institution or educational policy; 44 references concerned difficulties inherent to professors or teaching conditions; and 16 references were related to difficulties originating from students. Each of these categories was composed of subcategories. Among difficulties related to the *institution/educational policy*, the following subcategories were identified: working conditions for teaching (32 references); research working conditions (seven references); teacher education curriculum (33 references). Some examples mentioned by respondents were:

> There is an excess of bureaucratic tasks teachers must do, which takes up a great amount of time that could be useful for other tasks.
>
> Time is always scarce, which is a problem. A large number of students per class also makes teaching with research difficult.
>
> There is little support from leadership (coordinators, directors, presidencies, ...).
>
> The limit of possible credits to assign to each teaching field in the study plans does not offer much leeway to any institution that trains teachers.

The *difficulties inherent to professors* include the following subcategories: professional teaching cultures (23 references); professional research cultures (17 references); professor's pedagogical education (four references). The respondents stated:

> There is the problem of teacher mentality.
>
> There is still the idea that a good researcher is such an excellent scientist that it is acceptable or tolerable that he/she does not know how to teach...
>
> Some teachers are not involved in research projects.
>
> Lack of training of university professors themselves.

Among the *difficulties originating from students*, the following subcategories were identified: preference for transmissive teaching, with a traditional representation of the teaching profession (three references); lack of basic skills among students (13 references). Some examples mentioned by respondents are:

> Students still prefer classes that are lecture-style and expository, where they only have to memorize sets of information.
>
> The conceptions students have regarding the 'profession' are often dominated by a split between teaching and research.

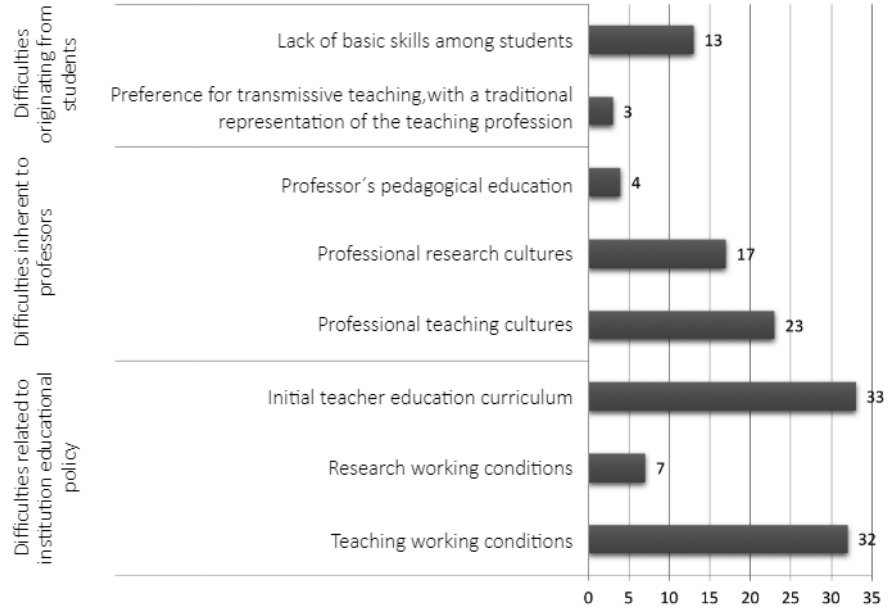
Absence of some skills, such as academic writing, critical analysis, and understanding of information, as well as research.

Weaknesses in terms of student autonomy, critical thinking and questioning – students are used to 'memorizing' instead of 'thinking'.

In short, the arguments presented and systematized in Graph 2 allow the conclusion that respondents view institutional factors as the greatest generators of teaching-research difficulties, specifically aspects related to the initial teacher education curriculum, as well as working conditions for teaching. Nonetheless, as the graph shows, there are still significant references to reasons associated with professors themselves and, primarily, with the professional cultures that surround them.

**Graph 2**

*Distribution of references by categories/subcategories of difficulties in achieving teaching with research*




Professors were also asked about the possibilities of conducting teaching with research, specifically in initial teacher education. The analysis of the 86 references identified shows 51 related to *institutional or educational policy possibilities* and 35 with *teacher-centered possibilities*. In the subcategories related to *institutional or educational policy possibilities*, five were associated with working conditions for teaching, 12 with research working conditions, and 34 with initial teacher education curriculum.

Related to the working conditions for teaching, the influence of time was mentioned ("The possibilities also depend on the availability in the schedules of students and professors") and the institutional cultures that are influencing the recognition that the mission of higher education is to produce research. Comments on this latter point included:

> Institutions are beginning to choose educational models based on research because they recognize that research is an asset for the contextualization of knowledge by students.
>
> Making the structure of initial teacher education courses more directed toward accepting teaching with research is a possibility/requirement.
>
> It is important to have a model which is more focused on training professionals in school settings, with a strong practical component, connections to schools, and partnerships with higher education institutions.

Of the 35 references that indicated possibilities for conducting teaching with research associated with *teacher-centered possibilities*, 23 refer to teaching and research cultures, and 12 pertain to professors' pedagogical education. In the latter case, respondents consider that this education may, or may not, provide them with the necessary sensitivity to the importance of research as an initial teacher education strategy. The respondents mentioned that:

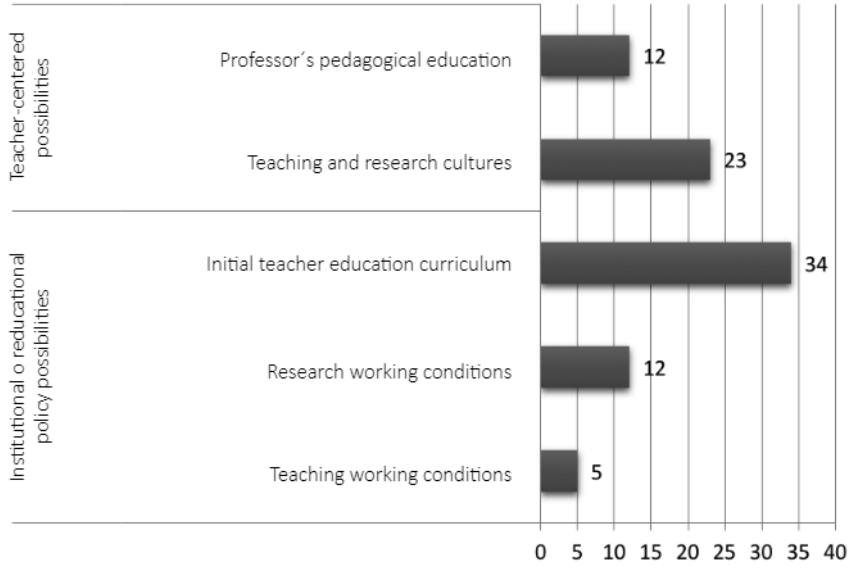
> There are possibilities to conduct teaching with research in initial teacher education if the teaching culture among teachers changes; that is if they shift from transmissive teaching to teaching centered on the students.
>
> There are some possibilities, especially if teachers are dedicated to researching their professional practice.
>
> The possibilities depend on the initiative and conditions of teachers to 'design' curricular units that emphasize and promote 'teaching with research' in which students develop research skills.

It is possible to conclude, in this case, that some of the professors interviewed referred to possibilities that could exist in the future and others mentioned possibilities they believe already exist. On the other hand, some professors referred to difficulties in achieving teaching with research, but also pointed out the existence of possibilities.

In sum, and as shown in Graph 3, the data allow the conclusion that *institutional or educational policy possibilities* were the most relevant for conducting teaching with research. Nonetheless, there were still 35 references to possibilities stemming from cultures or situations related to professors.

**Graph 3**

*Distribution of references by category/subcategory of possibilities for teaching with research*




A comparison of the reasons pointed out by these professors as difficulties and as possibilities for conducting teaching with research in initial teacher education shows they are primarily associated with the curriculum adopted. Portuguese legislation, when it comes to initial teacher education courses, leaves little autonomy to the institutions, as it establishes very "tight" ECTS limits for the different components that must be included in this curriculum. This situation, associated with the above-mentioned working conditions offered to professors, justifies the data obtained. However, to help understand why the initial teacher education curriculum was the most mentioned category as a possibility for conducting teaching with research, it is important to mention that, according to the policies that regulate initial teacher training courses in Portugal, the study plan must obligatorily include curricular units in which students/future teachers interact with professional realities. The curricular units of supervised teaching practice, as mentioned by the respondents, open up strong possibilities for a teaching-research relationship.

It is also interesting, when focusing on the possibilities of the teaching-research nexus, that reasons related to professors themselves were mentioned not only as difficulties but also as possibilities. As the excerpts reveal, some of the interviewees consider that cultures are emerging which recognize the possibility of conducting teaching with research.

## DISCUSSION AND CONCLUSIONS

As expressed throughout this article, the study was guided by the assumption that a teaching-research relationship promotes improved learning, while simultaneously favoring both teaching and research. In the case of initial teacher education, recognizing the complexity that the profession entails, as well as the involvement of students/future teachers in research processes built from the analysis of everyday school situations, i.e., focused on curricula practices, a teaching-research nexus contributes to facing situations and can support improvement processes (Leite et al., 2019). Regarding this belief, we followed arguments that strengthening the teaching-research nexus favors processes of reflection on how the teaching and quality of feedback provided to students occurred (e.g., Brew & Saunders, 2020; Korthagen, 2016; McCartney et al., 2018; Obwegeser & Papadopoulos, 2016; Willcoxson et al., 2011). The idea is similar to the thesis defended by Stenhouse (1987), who stated that teachers are surrounded by research opportunities in their classes that may lead to the introduction of the necessary changes.

The use of strategies that involve students in collaborative research work (Bovill & Felten, 2016), where they have to find arguments to justify their choices, allows them, as shown in the study by Willcoxson et al. (2011), not only to build knowledge but also to learn to question and examine situations related to daily professional activities. The results of the study presented in this article also point in this direction, reinforcing the importance of the teaching-research relationship in initial teacher education. Although this is an idea shared by most of the professors questioned, the arguments they use to justify it, however, take on different meanings. The *research-oriented teaching* dimension was the most frequently mentioned by professors, followed by *research-tutored teaching*, *research-led teaching,* and, lastly, *research-based teaching*.

As the study showed, teaching practice in which the teaching-research relationship is supported by vigorous networks of interactions between teachers and students, characterized by horizontality, is important both to improve teaching and learning (Healey, 2005). However, research-based teaching is far from common practice.

Once again, it is important to emphasize the aspect that, in the references made to justify the importance of teaching with research, these professors indicated reasons included in the four quadrants proposed by Healey's (2005) model, i.e., they placed this importance in a combination of all four approaches (Healey & Jenkins, 2006). Nonetheless, the study showed that, in addition to the professors' recognition of the importance of teaching with research, several difficulties in achieving it in initial teacher education were also mentioned. Of these difficulties, those that influence the low status attributed to teaching cannot be ignored, especially when the desire is to favor teaching-research nexus strategies, in line with the European

policy that instituted the Bologna Process (Leite, 2019; Leite, Fernandes & Pereira, 2017; Robertson, 2009; Veiga & Neave, 2015). On the other hand, for this debate, it is also important to consider bureaucratic administrative procedures (Haukland, 2017), which in many universities have led to research processes mainly guided by performance evaluation goals (Martin, 2017) and not focused on didactic research. In these cases, the research does not involve teachers in a teaching-research relationship with an impact on the learning of students/future teachers, based on the professional situations of everyday school life. This was highlighted by some professors, who emphasized the enormous institutional pressure to publish in large quantities rather than the effects of specific teaching practices.

Establishing a relationship with Healey's (2005) typology, it is desirable for teaching to be generated by research in order to promote systematic feedback. However, as stated above, for this relationship to exist, teaching must have the same status that has been given to research. This situation would contribute to breaking the myths that separate knowledge from research and knowledge from teaching and would allow higher education to fulfill its mission since it would be teaching with research.

As the professors' statements revealed, many of the difficulties in conducting teaching with research are rooted in the action contexts. Related to the institution/ educational policy, difficulties associated with working conditions for teaching and research, and with the curriculum for teacher education were identified. Related to difficulties inherent to professors, situations associated with professional teaching cultures, professional research cultures, and also with professors' pedagogical education were mentioned. Related to difficulties originating from students, situations associated with the preference for transmissive teaching, a traditional representation of the teaching profession, and the lack of basic skills among students were identified. However, the most mentioned difficulties were those related to the organizational and professional cultures, which is in line with some studies (e.g., Barnett, 2008; Fanny Chan Fong Yee, 2014; Griffiths, 2004; Hedges, 2010; Hughes, 2005; Karagiannis, 2009) that concluded their influence on the stratification of teaching with research. Along with Korthagen (2016), among others, we defend the thesis that *teacher education can make a difference*. However, for this to happen, it is necessary to intervene in cultures that acculturate the departments and the pedagogical work methods of professors (Jenkins et al., 2007). It is important to have institutional conditions that enhance the development of collaborative cultures between groups of professors and groups of professors and students which support the operationalization of the teaching-research relationship (Jenkins & Healey, 2005; Jenkins et al., 2007; Khan, 2017).

As pointed out in the study, the existence of collaborative cultures and research communities can promote transformational learning (Northouse, 2016). Perhaps

based on this idea, it has been argued that universities have not invested in their condition as learning institutions, particularly in their conditions to reflect on teaching and education, encouraging professors to develop knowledge related to this mission (Leite, 2019).

Trying to understand the difficulties pointed out by the professors questioned, who indicate institutional and educational policy concerns as the greatest difficulties for conducting teaching with research, it must be recognized that Portuguese legislation regarding initial teacher education courses defines tight limits on the number of ECTS to be assigned. Therefore, it is understandable that the teaching-research relationship has often been associated with supervised teaching practice, that is, curricular units that provide more opportunities for contact with real situations and, therefore, with research. The same occurs with curricular units focused on teaching research methodologies that familiarize students with their processes and procedures. On the other hand, it must also be recognized that the hierarchical structure (Bleiklie et al., 2015) of the organization of these courses, in which the departments have little autonomy, also contributed to the teaching-research relationship often happening more in an expository manner than from a practical perspective (Elsen et al., 2009).

In this line of thought, and based on the study undertaken, we maintain that to strengthen the relationship between teaching and research, particularly concerning initial teacher education, it is important to value and consolidate conditions for the existence of research communities, or research-based learning communities. These communities may enable the participation and sharing of knowledge and know-how, built on research practices that involve collaborative processes between professors, researchers, and students, be they undergraduates or postgraduates.

In sum, and recalling the research questions that were at the basis of the study, the results obtained reinforce the importance of the teaching-research relationship in higher education and initial teacher education. This is the case both from the point of view of the added value for students, professors, and higher education institutions, as well as to fulfill the mission of this level of education, within the framework established by the Bologna Process. On the other hand, as the data showed, there was evidence of the existence of diverse meanings regarding the forms, possibilities, and the importance of establishing the teaching-research relationship, which is in line with several studies that argue that the nexus of teaching-research is an essential dimension for teachers' professional development, and contributes to improving their practices and professional empowerment (Brew & Saunders, 2020; Cao et al., 2021; Flores, 2018; Guilbert et al., 2016; Katwijk et al., 2019; La Velle & Flores, 2018; Perines, 2020; Sousa et al., 2020).

Despite recognizing some limitations of the present study, namely the fact that a sample selected for convenience was used and that students/future

teachers were not included as interviewees, the knowledge produced contributes to the understanding of the importance of the teaching-research nexus. It also allows difficulties to be ascertained, but also the possibilities that exist for its implementation in the initial teacher education. It thus enhances epistemological contributions to support improvements in initial teacher education, both in terms of policies, as well as organizational and curricular measures.

For future research, it would be important to carry out case studies focused on the teaching-research relationship and its implications for students/future teachers. Situations showing evidence of school practices based on research-informed and its effects, as proposed, among others, by Ferguson (2021), could also contribute to improving teacher education. These future researches should integrate both the different agents involved in teaching-research processes (higher education professors and students/future professors) and the agents that influence teacher education (politicians and administration agents who define the laws that determine the way in which initial teacher education must be organized).

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