Research Article

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Teaching Research Methodologies in Education: Teachers' Pedagogical Practices in Portugal

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Abstract: Despite the several mismatches of methodological understanding between teachers and students in higher education, research methodologies in education are a relatively common pedagogical practice in most European advanced courses in education. However, only some studies have shown what pedagogical practices are mobilised by the teachers with their specific scientific conceptions. This article presents and discusses the results of an extensive research study conducted in Portugal with all the teachers involved in teaching research methodologies on master's and doctoral programmes in education. The results show the personal and professional characteristics of the teachers involved in this teaching and the type of senses, decisions, and challenges experienced when teaching research methodologies. The study identifies and characterises the research culture generated by the different pedagogical practices in this scientific field. Based on the results, we argue that the teachers' scientific conceptions and pedagogical practices may be developed by a "peer authorial construction of research understanding," aiming to provide appropriate educational experiences to students in research methodologies courses in advanced studies in education.

Keywords: higher education, methodological knowledge, research methodologies in education, pedagogical practices, scientific conceptions

1 Introduction

The higher education teachers' pedagogical practices on research methodologies are an emerging issue. However, few research contributions identify and reflect its characterisation. In a world in constant transformation through machine learning processes (e.g. data production via ChatGPT, net e-research, and data analysis software), higher education teachers' pedagogical practices become implicated. Pedagogical practices in Portuguese higher education have been under solid epistemological and methodological reflections impacted by governance reforms since 2007 (Magalhães & Veiga, 2023). Despite being part of this scenario, the scientific area of research methodologies in education (RME) has been on the second plan of this challenge's priorities (Matos, Piedade, Freitas, Pedro, & Dorotea, 2023). Understanding the pedagogical practices of teaching research methodologies is fundamental to the composition of a larger higher education scenario, involving students' experiences, institutions' organisational culture, and the rational development of the field itself.

Literature has indicated that no matter how strong the intention of professional development for teachers of research methodology is, several gaps still persist that inhibit the improvement of teaching methods. Talbott and Lee (2020) show that a lack of a common language persists, shared by those who teach it and those who learn it about the key concepts of RME. In Portugal, there are no specific continuing education courses to teach RME; therefore, teachers act as self-taught professionals. This lack weakens teachers' pedagogical skills. According to Ross and Call-Cummings (2020), the isolation of teachers' practices and the uncertainty that such situation generates is another crucial gap – teachers' practices are based on their own autonomous experiences. It is essential to understand whether this isolation scenario means limited space for sharing and reflection with peers and other professionals or if it is a choice assumed by the teachers. When this fragmented, fragile scenario is considered as a whole, the gap increases because it becomes clear that teaching RME is permeated by pedagogical misunderstandings that lie on a limited reflection basis (Nind, 2020). In this complex scenario of pedagogical practices of teachers responsible/involved in teaching methodologies in education, it is essential to identify and characterise pedagogical practices. The Research Methods in Advanced Studies in Education project was initiated in January 2022, aiming to

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identify and provide research-based principles and guidelines for designing research method courses in education that was put together as a framework. This report is part of that commitment.

This article aims to identify and characterise the scientific conceptions and pedagogical practices of teachers involved or responsible for teaching RME in advanced studies in Portugal (master and doctoral education programmes). The main research question addressed in this article is: What are the epistemological/methodological/ontological perceptions and pedagogical practices of teachers responsible or involved in teaching RME?

This article is organised into four major sections. Section 2 refers to the state of the art that informs trends in pedagogical practices for teaching RME. The report is based on the dimensions under analysis (scientific rationale, research design, and scientific writing). Section 3 refers to the methodology of the project, where the implemented phases for collecting and analysing information are described, highlighting and justifying the processes that were considered. Section 4 presents the research results addressing the research question operationalised through specific questions (personal and professional characteristics of the participants, pedagogical and scientific conceptions, and the type of pedagogical culture generated). Section 5 of this article concerns the interpretation and discussion of the results and ends with the conclusion in Section 6.

2 Teaching RME: Pedagogical Practices based on the Dimensions of Scientific Rationale, Research Design, and Scientific Writing

The state-of-the-art that sets up the theoretical context to present and discuss in this article is based on three dimensions of teaching RME. The first is the scientific rationale, detailed as dispositions for understanding methodological knowledge. The second dimension concerns research designs and their epistemological formulations, highlighting operational challenges, disputes, and disagreements. The third and last dimension that makes up the state-of-the-art is scientific writing, with its varieties of type and form, according to the dissemination aim of scientific knowledge. The three dimensions are correlated as they operate within the same logic to the same objective: to engage and develop fundamental principles in a pedagogical culture aiming to understand and undertake research (Matos, Freitas, Estrela, Galego C & Piedade, 2023).

The scientific rationale is one of the pillars of teaching and learning RME; however, the literature needs to include more methodological knowledge. According to Wagner, Garner, and Kawulich (2011), the misunderstandings began with the literature giving insufficient attention to the theoretical aspects of methodological knowledge. One way to provide conditions to start acknowledging this issue is by tailoring research questions and creating opportunities to understand research focused on methodological knowledge in ways that undertake research design layaway for writing and future dissemination (Aguado, 2009). The literature shows that to achieve this guiding sequence of teaching and learning RME, the reflection should be aimed at teachers' pedagogical practices. Encouraging reflection on teaching through practices of reflective language processes promotes a deeper knowledge of methodologies (Lewthwaite & Nind, 2016). According to Lewthwaite and Nind (2016), creating opportunities to reflect on research questions is a crucial way to understand that scientific rationale is not a static and perfect state that needs to be undertaken without the researcher. Therefore, to understand scientific knowledge, it is necessary to consider the researcher's intervention through reflective processes on their research questions. Teachers of RME are responsible for this understanding. Through their pedagogical practices, they promote students' learning and professional development (Nind & Lewthwaite, 2018). According to Saeed, Al-Ahdal, and Al Qunayeer (2021), this broad concept of scientific rationale is better understood as a research issue in teaching and learning RME when teachers promote pedagogical practices interested in mentoring students. However, students tend to strictly follow instructions given on research methodologies without questioning them (Rich, 2014). In this case, pedagogical practices of mentoring students to understand scientific rationale should be aligned with the idea that students may be unable to produce knowledge independently.

The scientific rationale of RME courses is complex in itself. Associated with this complexity is the "claim of hardness" of quantitative methodologies, provoking anxiety and the "depreciation of the credibility" of qualitative methodologies Matos et al. (2023). This complexity increases when teachers' pedagogical practices are focused on predetermined modes that do not foster student-centred learning encounters. According to Knipe, Miles, and Bottrell (2018, p. 53), students have difficulty understanding the transference of scientific rationale "[…] to the complex and often very disciplined specific terminologies and nuances of methodology identified by various approaches to educational research." Saeed and Al Qunayeer (2021) state that the most difficult pedagogical challenge when teaching RME is simplifying abstract information

about scientific rationale in methodological knowledge and making it understandable, learnable, and applicable to students through hands-on investigative practice. From research questions as a guiding element to research designs, it is considered that pedagogical practices should address epistemological formulations, highlighting operational challenges, disputes, and disagreements. This is the second dimension that can be identified in the state of the art for teaching RME.

The research design emerges as a crucial dimension in teachers' pedagogical practices in research methodologies based on the "desirable" pedagogical environment created and the research skills to be taught. A student criticism that translates into students' wishes is the organisation of teaching research methodologies through hands-on strategies. According to Luo (2017), teachers' pedagogical practices on research methodologies are not practical enough, focusing more on the scientific rationale than on its applied aspects. Nind (2020) found out that the degree of application of research methods differs between teachers, more committed to teaching quantitative and those who teach essentially qualitative methodologies, indicating that teachers of quantitative methodologies employ more of these operational practices. This result does not imply that teachers of qualitative methodologies mobilise less of these strategies in their pedagogical practices. According to Nind (2020), what is at stake is the perception of what hands-on practices are since teachers of qualitative methodologies mostly emphasise the processes of reflective encounters of the investigative practice. According to Ekmekci, Hancock, and Swayze (2012), one guiding question for teachers' pedagogical practices can be elaborated on to create a shared sense: Is my communication clear? Adopting pedagogical strategies that are hands-on and student-centred and therefore organised to be understood and undertaken by the receiver promotes this encounter. Besides the encounter between teacher and students, another identified trend in the literature that promotes a better understanding of research design is through co-teaching strategies (Fabregas & González, 2008) and student peer collaboration (Alharbi & Alqefari, 2021). When this "desirable" pedagogical environment makes up the teaching scenario, research design, as an issue in teachers' pedagogical practices, amplifies the possibilities for understanding the scientific rationale and operationalise it. Ultimately, we refer to the teachers' pedagogical practices that engage students in practices that include a variety of learning opportunities organised through training, reflection, and doing (Nind, Holmes, Insenga, Lewthwaite, & Sutton, 2019).

The research skills to be taught to undertake research from this scenario can be organised into three particular aspects of teaching. The literature shows that teaching research design, as the second major dimension constituting teachers' pedagogical practices, emerges mainly from (i) online activities and their pedagogical added value, (ii) by recognising students' prior skills and experiences, and (iii) by involving students in ongoing research projects with real data.

The use of online resources for data collection (e.g. online survey), for its analysis (e.g. support software), or even for scientific writing itself (e.g. simultaneous activity documents) is highlighted as opportunities to develop research skills (Saeed & Al Qunayeer, 2021). However, studies point to the need for customisation and adaptability of digital resources for specific learning according to student's needs (Rich, 2014). Some disadvantages are considered, such as frustration for not knowing how to operate the digital resources, generating confusion of methodological understanding (Secret, Bryant, & Cummings, 2017), and the absence of a more empathetic interaction between who learns and who teaches (Ivankova, 2010). These results make room for the discussion that such constraints may be associated with the fact that the previously presented premise about the teaching scenario being learner-centred was not put into practice. According to Ivankova and Plano Clark (2018), these results can be interpreted from the inadequacy of choices for teaching by the promotion of learning strategies for a specific learning environment (online) that may be a simplistic replication of the most common and general one (face-to-face). This is a clear indication that the needs of the students are at the centre of the teacher's pedagogical practice.

The literature indicates that pedagogical practices in teaching methodologies should consider knowing the students' background, whether in terms of personal interests or academic experiences (Nind & Lewthwaite, 2018). According to Luo (2017), one way to realise this premise in teaching RME is to understand students' interests in different research topics (scientific rationale, research design, and other subjects deemed pertinent by the teacher). From the results of such inquiries developed by teachers, it was understood that students need to be involved in research practices integrated into research projects as team members, acting as research assistants or volunteers in training. It is considered that hands-on learning activities using real-world examples allow students to understand how different research methods can be used to solve practical problems in the professional domain (Luo, 2017; Nind & Lewthwaite, 2018). Through these pedagogical opportunities, scientific rationale is understood within methodological issues emerging from practice within a variety of research designs and dissemination objectives.

As the last nuclear dimension in teaching RME, scientific writing appears as a new and current challenge, implied by the traditional logic of publishing or perishing.

Writing and publishing students' research articles can be a challenge, with a focus on teachers' (un)confidence about the reliability of the work produced (Alharbi & Alqefari, 2021). The issue is that students are "authors" in academic training. According to Alharbi and Alqefari (2021), students may be involved in writing and participating in the authorship of articles when scientific supervision is provided. This issue impacts teachers' pedagogical practices in different ways, whether it is within master's education programmes or doctoral programmes. A debate emerges from this: it is a fact that most of the RME students will not become future researchers as professional practitioners, but all of them should be consumers and, in some cases, producers of scientific knowledge. How do we balance these challenges that impact teachers' pedagogical practices? The results of this study may contribute to this understanding.

3 Methodological Approach

This article is part of a project under development named Research Methods in Advanced Studies in Education (ReMASE). The research inherent in the development of this article is framed within the principles of the interpretive and pragmatic paradigm (Creswell, 2010) and operationalised in a study that makes extensive use of quantitative data. The research methodology is developed considering the different objectives and operationalised by the guiding questions (Creswell, 2014).

In order to identify and characterise scientific conceptions and pedagogical practices in this area of education extensively, the population of this study is constituted of all the teachers who are responsible or involved in teaching RME in all higher education institutions in Portugal. This article focuses on the empirical results of the ReMASE project. Data were collected from July to October 2022.

Project ReMASE used a database to identify the respondents to the questionnaire survey. The eligibility criteria for constructing the database and the respective information extraction followed a sequential process in three phases. First, all master's and doctoral programmes in education and teaching in Portugal were identified through the agency that evaluates and accredits the programmes (A3ES[1]). In the second phase, those programmes that include courses on RME were identified among the active and functioning programmes. In the third phase, we collected information about the specific course syllabus on research methodologies, as well as institutional direct contacts with the program coordinators and teachers responsible or involved in the teaching of RME.

3.1 Objective and Research Question

This study aims to identify and characterise scientific conceptions and pedagogical practices of teachers responsible/involved in teaching RME in advanced studies in education in Portugal. The main research question that this article wants to address is: What are the epistemo/metho/ontological perceptions and pedagogical practices of teachers responsible/involved in teaching RME? Three specific questions were developed to operationalise better and answer the main research problem: (1) What are the personal and professional characteristics of teachers responsible/involved in teaching RME? (2) What are the teachers' pedagogical senses, decisions, and challenges in teaching RME? (3) What kind of investigative culture is generated in RME courses from different pedagogical practices?

3.2 Methods: Survey-Questionnaire

The operationalisation of the research design was based on the construction, validation, and application of a survey-questionnaire as an instrument to gather data (Creswell, 2010). The construction of the survey-questionnaire items responds to the specificities of the surveyed population: teachers responsible/involved in teaching RME. The first validation of the data collection instrument was based on actions to verify its relevance, reliability, and consistency in its different dimensions among research team members.

The survey-questionnaire was constructed and organised around two main elements of identification and characterisation: elements of personal (age and gender) and professional identification (highest degree and professional position and scientific area of the department) and elements of perceptions' characterisation of professional practices, with relevance for pedagogical and scientific practices, in the teaching of RME.

The elements for characterising perceptions of teachers' professional practices are more robust and, therefore, more precise. These elements of characterisation are distributed into two major groups. The elements are related to general professional characterisation and

1 Agência de Avaliação e Acreditação do Ensino Superior (A3ES). The A3ES is the structure responsible for validating and recognising master and doctoral programs in Portugal.

characterisation of pedagogical and scientific practice and culture, including the autonomous experience with higher education institutions, colleagues, and students in teaching RME. It also includes characterisation elements related to pedagogical and scientific culture on scientific rational thinking, research designs, and scientific writing (Table 1).

The survey-questionnaire is mostly formatted for closed-response questions, using scales and multiple-choice item selection. The survey-questionnaire also includes open-response questions. The scales used in the construction and organisation of the questionnaires are standardised in their specifics of agreement and frequency from 1 to 10, with 1 being strongly/very strongly disagree and 10 being strongly/very strongly agree.

The survey-questionnaire begins with a brief contextualisation of the ReMASE project, highlighting the specific objective of this data collection, indicating the conditions of guaranteed security (anonymity and confidentiality) to the participant, namely in the data treatment carried out. In the final part, the research team contacts are given for any additional information that the participants may request. After confirming the terms described, the participant consents to his/her participation in the study.

The survey-questionnaire was validated post facto using appropriate statistical tests, with Cronbach's alpha values above 0.8.

3.3 Data Collection and Analysis

The protocol for the instrument's application involved the participation of people as volunteers for the research. The ethical principles associated with the development of the study were followed in accordance with international guidelines (e.g. Ethical Standards of the British Educational Research Association) for the development of research in social sciences and humanities. To the processing of the data obtained, all the provisions laid down in the legislation were applied, namely in Articles 13–22 of the General Data Protection Regulation (EU) 2016/679 of the Parliament and of the Council of 27 April 2016 (RGPD), transposed to the national level by Law no. 58/2019, of 8 August. No ethical issues were identified, as all data collected are anonymous and confidential. The instrument was applied with the explicit consent of the participants.

The participants in data collection are teachers responsible/involved in teaching RME. Out of an identified population of 170 teachers, 85 responded to the questionnaire applied via an online platform. An invitation to participate was sent to the direct institutional contact of the participant.

The analysis of data collected followed a quantitative methodology, using data organisation and transformation strategies and using statistical descriptive analysis. The data analysis followed a quantitative methodology, using data organisation and transformation strategies and statistical descriptive analysis using measures of central tendency (e.g. mean and standard deviation). The frequency of responses to each item was also analysed to better understand the results.

4 Results

This section is structured by the three research questions. Accordingly, the results are organised into three main groups. The first concerns the personal and professional characteristics of teachers responsible/involved in teaching RME, the second group refers to the scientific conceptions that impact pedagogical decisions for this teaching, and the third group relates to the investigative culture generated in RME courses from different pedagogical practices.

4.1 What Are the Personal and Professional Characteristics of Teachers Responsible/Involved in Teaching RME?

The personal characteristics of the 85 teachers regarding their age and gender can be disclosed by informing that 55 teachers are female (64% of them are 45 years old or more)

Table 1: Elements of general professional characterisation and characterisation of pedagogical and scientific practice and culture in survey-questionnaire

Characterisation	
General professional	Experience in teaching RME (courses taught)
	Participation in research supervision, in scientific events and in the preparation and submission/analysis and assessment of research projects applying for national/international funding
Pedagogical and scientific practice and culture	Autonomous experience, experience with higher education institutions, with colleagues, and with students
	Knowledge dispositions on scientific rational thinking, research designs, and scientific writing

and 30 teachers are male (84% of them are 45 years old or more). In Figure 1, these results are detailed.

According to the professional identification of the participants, results show that all teachers (N = 85) have completed doctoral degree. The three major scientific areas of the doctoral degree are education (N = 47), representing 56% of the total. Psychology is the second scientific area with the highest number of occurrences (N = 10; 12%). The third main scientific area of the teachers' doctoral degree is sociology (N = 4; 5%). Other scientific areas include sports, philosophy, mathematics, biology, arts, literature, and informatics (N = 24), representing 27% of the total.

Most of the participants are in the first level of the academic teaching career (university or polytechnic). Thirty-eight teachers (45%) are Assistant Professors, and four teachers (5%) are Assistants with Habilitation. Regarding the second level of the academic teaching career (in the same model organisation), 23 are Associate Professors, representing 27% of the total. The other 20 teacher participants (23%) are at a higher level of the academic teaching career (Full Professor with Habilitation).

The main scientific area of the department where the teachers work is education/educational sciences (N = 37). The second main scientific area of the departments is teaching/didactics/teacher education (N = 24). The other scientific areas include sports, philosophy, mathematics, biology, arts, literature, and informatics (N = 24). Understandably, teachers belong predominantly to scientific departments, whose primary area is closely related to education (N = 61), representing 72% of the total.

Most of the participants work in higher education institutions located in the north of Portugal (N = 32) and the Lisbon metropolitan area (N = 30). At the centre of Portugal, there are 13 teachers, 7 teachers in the south, and 3 teachers in higher education institutions in the Autonomous Region of Madeira.

The professional characterisation of the 85 participants is now presented through their experience as teachers in higher education and teaching RME, detailing the master's and doctoral programs where they teach. The results section ends by presenting teachers' education or training in teaching RME courses.

The majority of the teachers began their teaching career in higher education in the 1990s (N = 28). The second large temporal group (decade) of teachers started their teaching activity in the 2000s (N = 22). The teachers with more years of experience teaching in higher education (N = 20) began in the 1980s. Since 2010, 14 teachers have experience in teaching in higher education. Of the participants, one answer is missing.

Regarding the first year of teachers responsible/involved in teaching RME, the results show that most of the teachers began in 2000 until the present year (N = 72): 36 teachers from 2000 to 2009 and 36 teachers from 2010 to the present year. In the 1980s, 2 teachers were already involved in teaching this domain, and in the 1990s, 10 teachers began teaching RME courses. Particularly concerning the temporal categories, it is possible to reveal that since 2007, 48 teachers began teaching RME courses, representing 56% of the total. Therefore, more than half of the teachers started teaching RME courses in the last 15 years.

The teaching experiences of the participants vary according to the type of programme (master's or doctoral). In the case of master programmes, the results show that 53 teachers teach in one or two master programmes, representing 62% of the total. Twenty-seven teachers are responsible for teaching three or more RME courses in master programmes, representing 32% of the total. Regarding the doctoral programmes, 36 teachers do not teach at this level, 40 teach in one doctoral programme, and 9 teach in two or three doctoral programmes.

The teachers were inquired about whether they had specific academic education/training to teach RME courses. The results are clear and directional, allowing for the realisation that 50 teachers (59%) do not have specific education/training and that 34 teachers (40%) have specific education/training in teaching RME courses. However, as there is no advanced programme in RME in Portugal, we cannot conclude about the type, duration, and quality of the training declared by those 34 teachers.

	N	%
Female	55	*64.7*
over 45 years old	46	*54.1*
30 to 45 years old	8	*9.4*
No answer	1	*1.2*
Male	30	*35.3*
over 45 years old	25	*29.4*
30 to 45 years old	5	*5.9*
No answer	0	*0.0*
Total	85	

Figure 1: Age and gender of participants.

4.2 What Are the Teachers' Pedagogical Senses, Decisions, and Challenges in Teaching RME?

This second section of results presents the participants' personal experiences in teaching RME courses. The results are organised and presented in two main groups: the sense of belonging to the academic and scientific community and the pedagogic culture of research in their professional activity as teachers in higher education with responsibilities/involvements with teaching RME.

On a scale of agreement (1 – strongly disagree; 6 – strongly agree), most teachers agree that the higher education institution's directory board recognises their work (M = 4.1, SD = 1.3). Similar values are identified regarding the results of recognition of the work by the academic community (M = 4.2, SD = 1.3). Regarding the statement "I have a strong sense of belonging to the academic and scientific community," most of the teachers agree (M = 4.7, SD = 1.2). These results are detailed, by agreement of the teachers, observed in Figure 2.

From each teacher's autonomous experience, the three major challenges involved in teaching RME courses are the "students' attitudes and motivations" (N = 63), the "lack of specific education/training" (N = 41), and the "complex syllabus" be taught (N = 37). Concomitantly, the highest number of teachers' professional activities are "student orientation and task-working" (N = 79), "researching specific information about this domain" (N = 84), and "teaching the course" (N = 80).

Concerning teachers' experience with higher education institutions and their colleagues, the three significant challenges involved in teaching RME courses are "development of scientific projects" (N = 58), "teamwork in research projects" (N = 54), and "research group management" (N = 48). In contrast with the previous results (regarding the autonomous experience), where the challenges are intrinsic to pedagogical challenges, in this result regarding experience with institutions and colleagues, the challenges are located to research issues.

Regarding teachers' experience with students, the three significant challenges identified are "interpretation of results of scientific papers" (N = 52), "quality/reliability of knowledge produced by students" (N = 52), and "students' opinions and (pre)concepts" (N = 47). In these results, the challenges involved in teaching RME courses are closely related to pedagogical and research issues.

The pedagogical culture of research in teaching RME courses is shown through the results obtained by agreement degrees on statements related to the teachers' pedagogical senses and decisions.

Regarding the statement "I encourage students to become agents of social change," most teachers agree (M = 5.1, SD = 1.1). Teachers are less likely to agree with the statement "I prepare students for scientific employment" (M = 4.2, SD = 1.3). In the statement "I provide emotional development of students," the mean agreement lies at 4.3 values out of 6 with a standard deviation of 1.4. Regarding the statement "I promote students' writing skills," teachers are more agreeable (M = 5.0, SD = 0.9) (Figure 3).

Regarding the statement "I create opportunities for integrating students in research projects," the agreement average is 4.2 out of 6, and the standard deviation is 1.4. Most teachers disagree with the statement, "I take pedagogical risks for potential scientific gains" (M = 3.7, SD = 1.6). The statement where teachers show the lowest degree of agreement is "I consider that research is overvalued in teachers' professional practice" (M = 2.8, SD = 1.7). The two statements with the highest degree of agreement are "I value the teaching of qualitative methodologies" (M = 4.9, SD = 1.3) and "I promote the development of scientific activities in my Higher Education Institution" (M = 4.9, SD = 1.2). These results are shown in Figure 4.

It was relevant to present the results that inform what the main specific and transversal competencies that students should learn from the RME course. The three main specific competencies are matching methods to research objectives (N = 82), accounting for 97% in total; applying research techniques (N = 82), with the same percentage incidence in teacher perceptions; and producing scientific

	1 - Strongly Disagree										Strongly Agree - 6				N Total	Mean	Standard Deviation
	1		2		3		4		5		6						
	N	%	N	%	N	%	N	%	N	%	N	%					
24.1 "I have a strong sense of belonging to the academic and scientific community"	1	1.2	2	2.4	12	14.1	21	24.7	21	24.7	28	32.9			85	4.7	1.2
24.2 "I know that my work is recognised by the scientific community"	2	2.4	7	8.2	15	17.6	26	30.6	18	21.2	17	20.0			85	4.2	1.3
24.3 "I know that my teaching experience in the area of research methodologies is recognised by my academic community"	2	2.4	7	8.2	20	23.5	19	22.4	24	28.2	13	15.3			85	4.1	1.3
24.4 "I know that my teaching experience in the area of research methodologies is recognised by students"	1	1.2	0	0.0	4	4.7	17	20.0	37	43.5	26	30.6			85	5.0	0.9
24.5 "I get great personal satisfaction from working as part of a team"	2	2.4	1	1.2	7	8.2	10	11.8	31	36.5	34	40.0			85	5.0	1.2
24.6 "I see myself as a scientist"	3	3.5	5	5.9	11	12.9	26	30.6	17	20.0	23	27.1			85	4.4	1.4
24.7 "I know that I contribute to the scientific community"	0	0.0	3	3.5	7	8.2	21	24.7	28	32.9	26	30.6			85	4.8	1.1

Figure 2: Sense of belonging to the scientific community.

	1 - Strongly Disagree										Strongly Agree - 6				N Total	Mean	Standard Deviation
	1		2		3		4		5		6						
	N	%	N	%	N	%	N	%	N	%	N	%					
42.1 "I encourage students to become agents of social change"	1	1.2	2	2.4	5	5.9	10	11.8	30	35.3	37	43.5	85	5.1	1.1		
42.2 "I prepare students for scientific employment"	4	4.7	7	8.2	13	15.3	21	24.7	28	32.9	12	14.1	85	4.2	1.3		
42.3 "I provide emotional development for students"	5	5.9	4	4.7	12	14.1	22	25.9	23	27.1	19	22.4	85	4.3	1.4		
42.4 "I promote students' writing skills"	0	0.0	0	0.0	6	7.1	18	21.2	29	34.1	32	37.6	85	5.0	0.9		

Figure 3: Agreement degrees regarding teachers' pedagogical senses and decisions (1/2).

	1 - Strongly Disagree										Strongly Agree - 6				N Total	Mean	Standard Deviation
	1		2		3		4		5		6						
	N	%	N	%	N	%	N	%	N	%	N	%					
43.1 "I create opportunities to integrate students into research projects"	0	0.0	13	15.3	16	18.8	13	15.3	27	31.8	16	18.8	85	4.2	1.4		
43.2 "I take pedagogical risks for potential scientific gains"	14	16.5	7	8.2	12	14.1	24	28.2	17	20.0	11	12.9	85	3.7	1.6		
43.3 "I consider that research is overrated in the professional practice of teachers"	26	30.6	20	23.5	13	15.3	8	9.4	7	8.2	11	12.9	85	2.8	1.7		
43.4 "I value the teaching of qualitative methodologies"	2	2.4	4	4.7	5	5.9	13	15.3	25	29.4	36	42.4	85	4.9	1.3		
43.5 "I promote the development of scientific activities at my Higher Education Institution"	1	1.2	4	4.7	4	4.7	16	18.8	31	36.5	29	34.1	85	4.9	1.2		

Figure 4: Agreement degrees regarding teachers' pedagogical senses and decisions (2/2).

knowledge (N = 67), accounting for 79% in total. Figure 5 shows the complete results.

Regarding those considered to be the transversal competencies required, the teachers highlighted three. The first, with the highest number of occurrences, is the structuring of the thesis/academic report (N = 83), representing 98%. The second highest identified competence is reading and interpreting scientific literature (N = 76), with 89%. The third and last competence elaborated and considered necessary as transversal to student learning with research methodologies is database use (N = 72), with 85%.

4.3 What Kind of Investigative Culture is Generated in RME Courses from Different Pedagogical Practices?

To disclose what kind of investigative culture is generated in RME courses from different pedagogical practices, results concerning scientific activities and pedagogical activities will be highlighted, aiming to foresee how teachers teach (pedagogical strategies) and what they teach (pedagogical content decision).

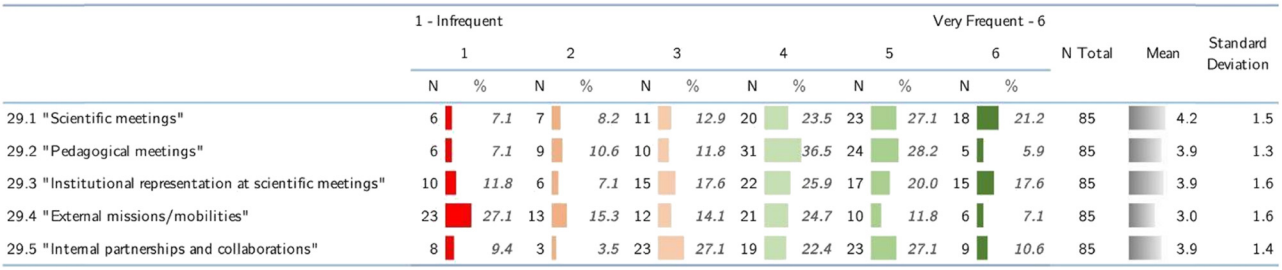
The frequency of teachers undertaking the different tasks of their professional activity is presented concerning the three-task composition. Regarding meeting with students to discuss research interests, most teachers consider it a widespread activity (M = 4.3, SD = 1.3). The second most frequent task performed by teachers is writing and publishing in scientific journals with students (M = 3.9, SD = 1.5). The third task performed is meeting with students to discuss research interests (M = 3.8, SD = 1.5).

Following the same organisation, another group of five tasks of teachers' professional activities and their specific frequency in their daily duties is now presented (Figure 6).

Of the tasks performed most frequently, to the tasks performed with less frequency in the professional activities of teachers, it is possible to organise them in the

	N	%
61.1 Produce scientific knowledge	67	78.8
61.2 Adjust methods to research aims	82	96.5
61.3 Apply research techniques	82	96.5
61.4 Use bibliographic standards for references	66	77.6
61.5 Critical interpretation	57	67.1
61.6 Don't know/ No answer	0	0.0

Figure 5: Specific competencies that students learn with RME.



	1 - Infrequent										Very Frequent - 6		N Total	Mean	Standard Deviation
	1		2		3		4		5		6				
	N	%	N	%	N	%	N	%	N	%	N	%			
29.1 "Scientific meetings"	6	7.1	7	8.2	11	12.9	20	23.5	23	27.1	18	21.2	85	4.2	1.5
29.2 "Pedagogical meetings"	6	7.1	9	10.6	10	11.8	31	36.5	24	28.2	5	5.9	85	3.9	1.3
29.3 "Institutional representation at scientific meetings"	10	11.8	6	7.1	15	17.6	22	25.9	17	20.0	15	17.6	85	3.9	1.6
29.4 "External missions/mobilities"	23	27.1	13	15.3	12	14.1	21	24.7	10	11.8	6	7.1	85	3.0	1.6
29.5 "Internal partnerships and collaborations"	8	9.4	3	3.5	23	27.1	19	22.4	23	27.1	9	10.6	85	3.9	1.4

Figure 6: Frequency of teachers performing the different tasks of their professional activity.

following order: scientific meetings; institutional representation at scientific meetings; internal partnerships and collaborations; pedagogical meetings; and external missions/mobilities.

Data collection allowed the identification of the following three major trends in teaching RME: (i) experimental activities/fieldwork improve research skills (M = 5.5, SD = 0.6); (ii) the dynamisation of group discussions among students promotes the learning of research methodologies/methods/techniques (M = 5.4, SD = 0.8); and (iii) digital resources stimulate learning of research methodologies/methods/techniques (M = 5.0, SD = 1.0). The characteristic with lower average agreement is the content exposition as the most used pedagogical strategy (M = 3.2, SD = 1.5). Figure 7 shows the complete set of results for the characteristics described.

Among the five frequently employed working methods in professional practice, the most commonly used are presented in descending order: theoretical–practical (M = 5.2, SD = 0.9), tutorial (M = 4.6, SD = 1.3), seminar (M = 4.4, SD = 1.6), theoretical (M = 3.4, SD = 1.5), and laboratory (M = 2.2, SD = 1.5).

Regarding the teaching methods, following a similar selection criterion, the most frequently utilised are presented in descending order: in-class debates and discussions (M = 5.4, SD = 0.8), project design (M = 4.9, SD = 1.2), critical analysis of texts (M = 4.8, SD = 1.0), guest speakers (M = 3.4, SD = 1.5), exposition of contents (M = 3.9, SD = 1.4), and virtual communities (M = 2.7, SD = 1.7).

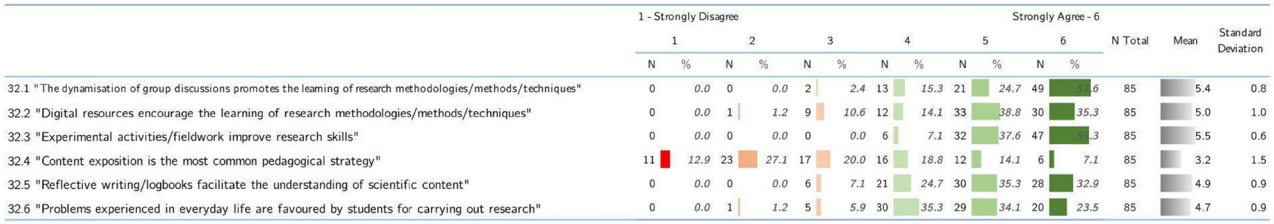
Concerning the different learning activities in professional practice, the following are the most frequently employed: presentation of papers (M = 5.2, SD = 1.1), peer/group assignments (M = 5.0, SD = 1.3), debates (M = 4.6, SD = 1.3), individual assignments (M = 4.5, SD = 1.4), and fieldwork (M = 4.0, SD = 1.5).

From a selection of five assessment methodologies commonly employed in professional practice, the most frequently used are presented in descending order: individual project submission (M = 5.0, SD = 1.4), individual project presentation (M = 4.8, SD = 1.6), class participation (M = 4.7, SD = 1.3), test (M = 2.3, SD = 1.8), and final exam (M = 1.8, SD = 1.4).

Concerning the different types of references in professional activity, the most frequently used are scientific papers (M = 5.5, SD = 0.8), books (M = 5.0, SD = 1.2), research textbooks/handbooks (M = 4.8, SD = 1.4), and congress proceedings (M = 3.5, SD = 1.7).

Regarding data illustrating what teachers teach in RME courses in advanced education programmes, the results can be organised by main methodological themes, primary ontological issues, main methodological paradigms, main research methods, main research techniques, and main writing styles and structures.

The main methodological themes that are taught are qualitative/quantitative approaches (N = 80), corresponding to 94%; validity and reliability of data collected (N = 77), meaning 91%; and multi-method approaches (mixed methods), corresponding to 67% (N = 57); and other methodological themes (N = 2), 2.4%.



	1 - Strongly Disagree										Strongly Agree - 6		N Total	Mean	Standard Deviation
	1		2		3		4		5		6				
	N	%	N	%	N	%	N	%	N	%	N	%			
32.1 "The dynamisation of group discussions promotes the learning of research methodologies/methods/techniques"	0	0.0	0	0.0	2	2.4	13	15.3	21	24.7	49	57.6	85	5.4	0.8
32.2 "Digital resources encourage the learning of research methodologies/methods/techniques"	0	0.0	1	1.2	9	10.6	12	14.1	33	38.8	30	35.3	85	5.0	1.0
32.3 "Experimental activities/fieldwork improve research skills"	0	0.0	0	0.0	0	0.0	6	7.1	32	37.6	47	55.3	85	5.5	0.6
32.4 "Content exposition is the most common pedagogical strategy"	11	12.9	23	27.1	17	20.0	16	18.8	12	14.1	6	7.1	85	3.2	1.5
32.5 "Reflective writing/logbooks facilitate the understanding of scientific content"	0	0.0	0	0.0	6	7.1	21	24.7	30	35.3	28	32.9	85	4.9	0.9
32.6 "Problems experienced in everyday life are favoured by students for carrying out research"	0	0.0	1	1.2	5	5.9	30	35.3	29	34.1	20	23.5	85	4.7	0.9

Figure 7: Agreement degrees regarding the teachers' experiences with students.

Concerning the primary ontological issues taught, the results indicate that 84% of the participants instruct on the ethical dilemmas of being a researcher (*N* = 71), 67% cover researchers' social responsibility (*N* = 57), 48% delve into legal issues related to research in education (*N* = 41), 2% do not include ontological themes in their teaching (*N* = 2), and 4% of the teachers address other ontological issues (*N* = 3).

Regarding the main methodological paradigms, the findings reveal socio-critical (*N* = 52, 61%), phenomenological (*N* = 48, 57%), naturalistic (*N* = 48, 57%), narrative/life stories (*N* = 45, 53%), positivist (*N* = 33, 39%), symbolic interactionism (*N* = 22, 26%), other methodological paradigms (*N* = 7, 8%), and 6% do not incorporate methodological paradigms in their teaching (*N* = 4).

In terms of the primary teaching research methods, the results show that 91% teach case study (*N* = 77); 88% cover action research (*N* = 75); 68% include documental research (*N* = 58); 61% instruct on descriptive, exploratory, and correlational studies (*N* = 52); 52% teach narrative/biographical method (*N* = 44); 41% include experimental, quasi-experimental method (*N* = 35); 39% of the teachers incorporate ethnography (*N* = 33); and 2% of the participants cover other research methods (*N* = 2).

Concerning the main research techniques taught, the results are as follows: individual interview (*N* = 81, 95%), participant observation (*N* = 74, 87%), focus group (*N* = 74, 87%), questionnaire (*N* = 72, 85%), photovoice and similar (*N* = 12, 14%), other research techniques (*N* = 1, 1%), and 1% do not include research techniques in their teaching (*N* = 1).

Regarding the main writing style forms, the results reveal that the authorial, original, and critical form of style corresponds to 71% of teachers' practices (*N* = 60); institutional, procedural, and bureaucratic form of style corresponds to 31% (*N* = 26); and 22% of teachers do not teach writing forms of styles (*N* = 19). Regarding the writing structures that are taught, the results are as follows: dissertation/thesis (*N* = 78, 92%), scientific article (*N* = 66, 78%), report (*N* = 64, 75%), poster (*N* = 32, 38%), other writing structures (*N* = 3, 4%), and 1% of teachers do not teach writing structures (*N* = 1).

5 Discussion

The group of participants of this study has extensive expertise in teaching RME courses at an advanced level within the field of education. This expertise is underscored by their substantial years of teaching experience in higher education and specific training and teaching involvement in RME. The majority of the teachers have more than 30 years of experience (*N* = 48). Given that the study is contextualised within the transformative period of 2007 – a pivotal year marked by significant changes in higher education in Portugal due to the Bologna Agreement – the results take a unique significance. Notably, 21 teachers started their careers within this era of substantial educational reforms in higher education, constituting 25% of the participants.

Given the considerable tenure of these educators, it becomes imperative to focus the discussion on aspects that offer a comprehensive understanding of their extensive pedagogical practices in RME. This entails a nuanced exploration of their scientific perspectives and insights into their challenges. The ensuing discussion will delve into the sense of belonging and the pedagogical and scientific culture inherent in RME courses, elucidating specific elements. The discussion will culminate in examining the pedagogical decisions made in response to the encountered challenges.

The results show high levels of the teachers' sense of belonging to the academic and scientific community. Most of the teachers believe that their work is recognised by different educational agents, such as the board directory of higher education institutions, peers, and students. From the 85 participants, 61 teachers assume that their work is recognised by the scientific community (72%). The other 24 participants present values of slightly (*N* = 15) to moderately disagreement (*N* = 7). In fact, the literature shows understandings of what can be described as the pedagogical implications beyond this recognition. Nind and Lewthwaite (2018) report that from the scientific community, especially from students, one implication of recognising the teacher's work is based on the "new demands." The cultural and social context of students as a core element while teaching RME courses Matos et al. (2023) is highlighted here. It is considered that from teachers' work recognition, they must continually endeavour to use the student's prior knowledge and experiences (Nind & Lewthwaite, 2018).

The results of the study reveal that almost all the teachers considered that they must continually invest in teaching towards environments that favour using real data. However, most of them agree that this work needs to be undertaken in a responsible and ethical learning scenario. These results are in line with the literature. The study by Nind (2020) shows that through active learning centred on the student, the teaching of RME is increased. Using real data and reinforcing ethical practices as a strategic pedagogical activity increase student learning (Nind, 2020). The type of sense of belonging to the scientific

community that is generated seems to be interconnected with the scientific community's own production.

The participants' peers also reinforce the sense of belonging to the scientific community. Most of the teachers have great personal satisfaction in collaborating with their peers (88%). This result aligns with the number of teachers who do not teach RME alone ($N = 44$). The literature shows that co-teaching or peer collaboration in the teaching of RME courses is considered a valuable learning experience for students (Alharbi & Alqefari, 2021). A similar value is recognisable in teachers' professional development, when they teach together, rather than self-teaching (Fabregas & González, 2008). This interpretation is better understood when it is taken into account a specific result from the applied survey to teachers. Most of the participants reveal that, based on the students' main interests, authorial work contributes to knowledge construction in RME courses. It becomes clear that between the directory board of higher education institutions, teachers' peers and students, teachers' sense of belonging is based on the "peer authorial construction of research understanding" aiming to provide appropriate educational experiences to students in RME courses in advanced studies in education.

The other fundamental set of results necessary to promote the reflection on the characterisation of teachers' extensive pedagogical practices in RME is the pedagogical and scientific culture that is neutered within these courses. The results show two major dimensions of this culture. The first dimension is practical in nature and concerns to research operationalities. The other dimension is more concerned with epistemological issues of being a researcher. From the 85 teachers in our study, 79 participants agreed that they promote a pedagogical and scientific culture through research competencies of writing, and 77 teachers agreed that they encourage students to become agents of social change. These two dimensions can be, respectively, associated with research undertaking and research understanding. Although not statistically significant, the dimensions less nourished in the culture by the teachers are the encouragement of students to find future scientific professional roles ($N = 24$) and the promotion of opportunities for students to engage in research projects ($N = 29$).

These four detailed results allow the understanding of a culture generated in a way that favours practical and critical research activity towards the future, however, in some way disconnected from research as a job. The literature is yet limited in discussing teachers' views on research employment. However, according to the literature, the pedagogical context is at stake in this scenario (Lewthwaite & Nind, 2016). Therefore, students are in training and teachers are more focused on acquiring knowledge and transformative skills integrated into an educational process with a beginning, middle, and end in sight (Aguado, 2009). This understanding becomes clearer with our study results. According to 33 teachers of the 85 study participants, they do not take pedagogical risks in favour of scientific gains. This is a relevant topic for further studies. The study results also allow the specification of scientific and pedagogical elements constituting the culture generated in RME courses.

The specific scientific elements nurtured in the generated scientific and pedagogical culture are more concerned with research application to the detriment of research interpretation. The application of data collection techniques ($N = 82$) is the element most implicated in the teaching of RME. The element with the lowest number of teacher mentions is regarding the critical research interpretation ($N = 57$). According to Lewthwaite and Nind (2016), this issue in teaching and learning RME must be counteracted through teachers' engagement in valuing the importance of the researcher intervention in the research. Centring on the researcher's intervention enhances the understanding of science beyond its mere application. One appropriate way to start to implement this in the scientific and pedagogical culture generated in RME courses, is by highlighting the definition of research questions – which implies the undertaking and the understanding of research (Lewthwaite & Nind, 2016). What can be understood from the survey results is that this type of work with students can be achieved. From the 85 participants, 64 teachers referred to meet regularly with students to discuss their research interests.

Regarding the specific pedagogical elements that can be presented as constitutive of the scientific and pedagogical culture generated in RME courses, it can be organised by the one with more teachers' reference and the one with less reference from teachers. The pedagogical element that permeates the culture throughout the teachers' investment of their time is the search for information. The pedagogical element with less impact on the culture constitution is project participation. This result is further detailed by highlighting that one of the least frequent activities in teachers' professional practice, affecting the creation of this culture, is external missions or mobility. From the participants in this study, half of them do not enrol in mobility actions. These results align with the previous one regarding the understanding of a culture that is generated in a way that favours students' connection with research, however, apart from research as an integral activity based on a "collaborative research project" (see Matos et al. (2023)). This fragmentation has already been partly understood in the Portuguese context by analysing the RME course syllabus Matos et al. (2023).

The results of our study also provide insights into the teachers' pedagogical decisions taken within RME courses in the face of their experienced challenges over the years. It becomes clear that most of the teachers developed their teaching according to decisions based on scientific reflection of different modes of understanding and undertaking research. For most of the participants in our study, the decision to teach epistemological themes tends to favour the debate of scientific paradigms as well as to favour both qualitative and quantitative approaches. Teaching ontological themes, teachers favour the ethical dilemma of being a researcher. The results also allow us to understand that teachers in general favour the authorial, original, and critical form of scientific writing, taking the dissertation in the case of master programmes, or the thesis in the case of doctoral programmes, as the main writing structure that teachers favour in their pedagogical decisions. The main research paradigms, methods, and techniques taught can be highlighted. The main research paradigms taught are socio-critical and naturalistic, together with the phenomenological paradigm. The main research methods taught in RME courses are the case study and action research. The main research techniques taught are the interview and participant observation, together with the focus group. This trend in the teachers' pedagogical decisions aligns with the literature that shows the importance of teachers increasing the reflection on the different ways to understand research. Based on the study of Knipe et al. (2018), these teachers' pedagogical decisions contribute to reducing the negative impact on students' learning experiences with RME. However, the diversity could be increased. For example, in the paradigms taught, only 26% of the teachers indicated teaching symbolic interactionism, and 39% referred to teaching positivist paradigms. In teaching methods, 39% of the teachers were revealed to teach ethnography, and 41% were revealed to teach experimental and quasi-experimental methods. The research techniques less taught is the photovoice or similar techniques.

The development of RME teaching faces some challenges. According to the study participants, these challenges are mostly related to the students' attitudes towards RME courses and the research extension of the teachers' activities.

From the autonomous experience of the 85 study participants, 75% reveal that students' attitudes and motivations are the major challenges while they teach RME courses. Another major challenge emerges from the teacher's experience with the higher education institution where they undertake their teaching. About two thirds of the teachers indicate that developing scientific projects becomes a challenge for teaching. From the experience with students, 61% of the teachers considered that quality and reliability of students' knowledge production is a major challenge for their teaching and the students' capacity to interpret scientific studies. Those results suggest that the pedagogical recommended practices in the literature for teaching and learning RME based on student learning-centred approaches are not being fulfilled. For this change to happen, should the responsibility of students be reinforced in teachers' practices, or should it be considered as normal that students show high levels of learning difficulties that limit the teaching of RME courses?

It would be rather relevant to study students' perceptions of these results. What the literature reveals, in a comprehensive way, is that when students are faced with RME courses that involve them in personal, social, and cultural terms, through active learning strategies with direct and real contact with investigative practice, their scientific skills in understanding and undertaking research increase exponentially (Knipe et al., 2018; Luo, 2017; Nind & Lewthwaite, 2018; Nind et al., 2019). This issue can be further addressed by understanding how these senses, decisions, and pedagogical challenges can be overcome. The literature shows ways to make it happen, such as playful strategies (Knipe et al., 2018) or online activities (Saeed & Al Qunayeer, 2021). The results of our study make room for the design and development of new research questions on teachers' pedagogical decisions towards teaching RME.

6 Conclusion

This article provides research-based insight into scientific conceptions and pedagogical practices towards teaching research methods in RME courses. The article aims to identify and characterise these conceptions and practices. Regarding the teachers' scientific conceptions, the main conclusion is that teachers think and act towards research closely to other researchers, but not necessarily with ongoing research projects. The results show that teachers' scientific conceptions are built in tandem with peers (mainly in internal environments such as the higher education institution's colleagues). Another dimension that characterises the teachers' scientific conceptions is the autonomous research practice that these teachers pursue in their daily activities (and therefore more closely related to their own research interests), such as students' mentoring and their research issues to be undertaken. The main conclusion regarding the pedagogical practices, which implies the teachers' scientific conceptions, relates to what they teach. Based on these results, it became relevant to understand how they teach (with its specific scientific and

pedagogical strategies along the RME course) in further studies. Most of the teachers dedicate their teaching to diverse and collaborative types of understanding and undertaking research. Despite this result, innovative approaches are still not implemented in teachers' pedagogical practices. The main dimension of the teaching is regarding students' needs towards the mandatory learning outcomes of the RME courses. Understandably, teachers favour pedagogical practices that inform the necessary epistemological paradigms to be reflected, the main method to be applied in a unidirectional and focused pedagogical framework for writing and publishing a dissertation/thesis. It can be understood that, in the specific and limited time and space of the RME course in the master or doctoral programme, the integration of the students' interests and the possibilities for reflection on the construction of scientific knowledge are fragmented. What is at stake is the one-dimensionality and focus of what students will develop as research themes in their dissertation/thesis. An important question that emerges is the need to understand whether the research themes are also developed by students based on the teacher's pedagogical offer. How do teachers include students' interests in their teaching practices, and how do they meet these particularities in their teaching plan every year (with different students every year)?

The main conclusions of this study suggest further studies with detailed research guidelines. Results show that the main teachers' epistemological, methodological, and ontological perceptions and practices are more qualitative-oriented. However, the quantitative approaches are referred to as taking part in teachers' practices suggesting some contradictions in practice. This can be observed in the research paradigms that they teach, in the research methods that are taught and also in the research techniques. In general, the teachers' scientific conceptions and pedagogical practices are closely connected with their peers and students through understanding research and undertaking research issues. It is also possible to argue that, based on these results, the teachers' scientific conceptions and pedagogical practices may be developed by a peer authorial construction of research understanding, aiming to provide appropriate educational experiences to students in RME courses in advanced studies in education.

The results of this study also show that teachers (mostly female) come from different backgrounds (regarding their workplace location as well as their doctoral scientific area) and are highly experienced in higher education teaching. Many of the study participants have had teaching experiences since the 1980s, but most of them started teaching RME from 2000 in general with no specific training in research methods.

The study shows that teachers have a sense of their work being recognised by educational agents and the scientific community. The main challenges are distributed by teachers' autonomous experience and experience with students and higher education institutions. The transversal dimensions in these three experiences reveal challenges with students' understanding and undertaking of research and scientific knowledge of the ongoing research projects and the different stages and dimensions of doing research. In these scenarios, it is understood that teachers focus on students' pedagogical engagements with research methods towards their development with research understanding and undertaking.

Finally, regarding the research culture generated within RME courses, the study suggests the involvement of students in fieldwork research within theoretical–practical contexts of teaching and learning experiences, where debates, peer discussion, and project designs to be undertaken are encouraged. It is understood that the type of culture generated in the RME courses highlights hands-on pedagogical approaches focused on students' learning outcomes, specifically the writing research. The idea that the scientific component needs to be more implicated in the generated culture of teaching and learning RME courses is coherent with the literature. Results show a slightly pedagogical emergence of formulation of a research culture. However, creating and sustaining a research culture (encouraging teachers and students to undertake research with real data from ongoing research projects) should be aimed. The complexity of training students in research methods in education should be preserved, avoiding simplistic solutions that do not take into account the contextual reality and the aims of the master and doctoral programmes.

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