The evolution of teachers' teaching beliefs in response to continuous professional development: an intervention study



Oscar Urmeneta
Kellogg College
University of Oxford

A thesis submitted for the degree of
Doctor of Philosophy

Trinity Term 2026

To the women of my life:

my wife Blanca

and

my daughter Clara

Abstract

Educational change efforts rely on professional development to help teachers transform their classroom practice, which requires the development of their beliefs about teaching. Teacher educators committed to these efforts strive to devise effective, transformative programmes, and thus they need to understand how in-service teacher education influences teachers' beliefs. However, the evolution of teachers' teaching beliefs in response to continuous professional development is underresearched, and the dynamics of factors shaping it remains virtually unexplored. This integrated thesis including 3 articles addresses this gap in research, exploring the response of 55 secondary teachers of 11 schools across Spain to a bespoke, two-year programme seeking educational change. In doing so, it makes empirical and methodological contributions. In empirical terms, the use of flexible a priori coding and cluster analysis from a synergetic approach provides evidence that teaching beliefs are complex, multifaceted, and evolve unequally from different perspectives. This diverse evolution crystallises in three profiles of teacher response to the change intended by continuous professional development: effectively adaptive, reportedly adaptive, and maladaptive. These profiles imply the existence of some factors influencing teaching belief development, some of them ignored by the literature on teachers' beliefs. They hint at the lesson planning phase of teaching as a relevant obstacle, as if the transformative power of in-service teacher education might well be largely lost already before classroom practices. They also imply the impact of teaching experience, prior beliefs, and type of schooling. Moreover, an exploration of teachers' reflections through thematic analysis and matrices provides a three-dimensional taxonomy of 28 influential factors which also suggests the prevalence of teachers' perception of students' resistance over that of students' actual learning. A post-cognitivist approach to teacher growth delves into the dynamics between the 28 factors, uncovering for patterns of interaction that support, and allow to better understand, the influence exerted by those mentioned earlier. Methodologically, this study supports the particular suitability of the practitioner researcher position to understand teachers' response to in-service teacher education and makes 4 contributions that could be of some value for future research: a) it explores an innovative ontological approach underpinning mixed methods; b) it develops a form of digital journaling that could help to maximise trustworthiness within challenging positions; c) it adopts a person-centred, synergetic approach still unexplored in research into belief development; and d) it delves into a post-cognitivist approach to teacher growth, accounting for the role of emotions in belief change, largely ignored by the literature.

CONDENSED TABLE OF CONTENTS

1. Introduction
- 1.1 Background, research problem, and research questions
- 1.2 Structure of the thesis
- 1.3 Overall argument

2. Theoretical frameworks
- 2.1 The two-dimensional nature of teaching beliefs
- 2.2 The Interconnected Model of Teacher Professional Growth
- 2.3 Aspect-based sentiment analysis

3. Methodology and methods
- 3.1 Methodology: a piece of practitioner research in the form of a case study
  - *3.1.1 The case: a multi-school, multi-year intervention*
  - *3.1.2 Robustness of the case study*
  - *3.1.3 Rigour of the piece of practitioner research*
- 3.2 Methods
  - *3.2.1 Methods and research questions*
  - *3.2.2 Methods for data collection*
  - *3.2.3 Methods for data analysis*
  - *3.2.4 Ethical considerations*

4. Article 1: ***Maximising methodological rigour within challenging positions: philosophical engagement and digital journaling***

5. Article 2: ***Understanding the influence of continuous professional development on teachers' teaching beliefs***

6. Article 3: ***What facilitates or inhibits teaching belief change in continuous professional development? Findings from Spain***

7. Discussion and conclusions

8. List of references not included in the articles

9. Appendices

EXTENDED TABLE OF CONTENTS

Abstract *3*
List of abbreviations *8*
List of Figures *8*
List of Tables *8*
1. Introduction *9*
1.1 Background, research problem, and research questions 9
1.2 Structure of the thesis 13
1.3 Overall argument 14
2. Theoretical frameworks *20*
2.1 The two-dimensional nature of teaching beliefs 20
2.2 The Interconnected Model of Teacher Professional Growth 23
2.3 Aspect-based sentiment analysis 26
3. Methodology and methods *27*
3.1 Methodology: a piece of practitioner research in the form of a case study 27
3.1.1 The case: a multi-school, multi-year intervention 27
3.1.2 Robustness of the case study 30
3.1.2.1 Scope 30
3.1.2.2 Generalisability 32
3.1.2.3 Reliability and validity 32
3.1.3 Rigour in practitioner research 33
3.2 Methods 34
3.2.1 Methods and research questions 34
3.2.1.1 Mixed-method approach to research questions 1 and 2 34
3.2.1.2 Qualitative approach to research questions 3 and 4 37
3.2.2 Methods for data collection 37
3.2.2.1 Teachers' self-report of their TBs 37
3.2.2.2 Teachers' comments and reflections during the CPD programme 40
3.2.2.3 Teachers' pre-class action in the form of lesson plans 40
3.2.3 Methods for data analysis 43
3.2.3.1 Research question 1 & 2: flexible a priori coding, quantification, and cluster analysis 43
3.2.3.1.1 Phase 1: flexible a priori coding and quantification 43
3.2.3.1.2 Phase 2: cluster analysis 50
3.2.3.2 Research questions 3 and 4: thematic analysis, matrices, and IMTPG 52
3.2.3.2.1 Phase 1: thematic framework to identify the influential factors 53
3.2.3.2.2 Phase 2: matrices to explore the nature of factors 55
3.2.3.2.3 Phase 3: the IMTPG to *uncover the underlying dynamics between factors* 56
3.2.3.2.4 Phase 4: matrices to explore association of factors with demographic variables 57
3.2.4 Ethical considerations 57
4. Article 1: Maximising methodological rigour within challenging positions: philosophical engagement and digital journaling *62*
4.1 Abstract 62
4.2. Introduction 62
4.3 My practitioner researcher position 64
4.4 Underpinning the use of mixed methods 66
4.4.1 The issue of paradigm incommensurability 66
4.4.2 Zubiri´s philosophical approach 67
4.2.2.1 Ontology: reality as alterity in primordial apprehension 68
4.2.2.2 Interpretivist epistemology and mixed methods 69
4.6. Validating the findings by increasing trustworthiness 71
4.6.1 Maximising credibility by harnessing positionality 72

4.6.2 Journaling as a tool for transferability, dependability, and confirmability 73
4.6.2.1 Digital, mixed journaling 74
4.6.2.2 Journaling and transferability 76
4.6.2.3 Journaling and confirmability 79
4.6.2.4 Journaling and dependability 81
4.7. Discussion 83
4.8 List of references 84
5. Article 2: Understanding the influence of continuous professional development on teachers' teaching beliefs 91
5.1 Abstract 91
5.2 Introduction 91
5.3 Literature review 92
5.4 The professional development initiative 97
5.4.1 Team-Based Learning 97
5.4.2 The CPD programme 98
5.5 Theoretical framework 100
5.6 Methodology 102
5.6.1 Data collection 102
5.6.1.1 Mixed-method approach 102
5.6.1.2 Validated questionnaire 103
5.6.1.3 Reflective writings in online portfolios 104
5.6.1.4 Artifacts in the form of lesson plans 105
5.6.2 Data analysis 106
5.6.2.1 Synergetic mixed-method approach 106
5.6.2.2 Enacted TBs: lesson plans 108
5.6.2.3 Implied TBs: teachers' reflections 109
5.6.2.4 Self-reported TBs: teachers' self-appraisal 109
5.6.2.5 Integration of perspectives: profiling change in TBs through cluster analysis 110
5.7 Findings 110
5.7.1 Profiles of the evolution of TBs 110
5.7.2 Association of demographic variables with profiles 113
5.8 Discussion 114
5.9 Implications for policy, practice, and future research 116
5.10 References 118
6. Article 3: What facilitates or inhibits teaching belief change in continuous professional development? Findings from Spain 129
6.1 Abstract 129
6.2. Introduction 129
6.3 Context and CPD programme 132
6.4 Theoretical framework 134
6.5. Methods 136
6.5.1 Data collection 136
6.5.2 Data analysis 137
6.5.2.1 Phase 1: identifying the influential factors 138
6.5.2.2 Phase 2: exploring the nature of factors 139
6.5.2.3 Phase 3: understanding the underlying dynamics between factors 140
6.5.2.4 Phase 4: uncovering possible associations between factors and subgroups of teachers 141
6.6 Ethical considerations 141
6.7 Findings 142
6.7.1 The three-dimensional taxonomy of influential factors 142
6.7.2 The dynamics between factors 144
6.7.2.1 One change sequence and three growth networks 144

6.7.2.2 Change sequence 144
6.7.2.3 Growth network 1: TBs and lesson plans 145
6.7.2.4 Growth network 2: TBs and classroom practice 146
6.7.2.5 Growth network 3: TBs, students' response, and teaching practice 148
6.7.3 The association of factors with subgroups of teachers 151
6.8 Conclusion 151
6.9 List of references 155
7. Discussion and conclusions 163
7.1 Limitations 163
7.2 Contributions 166
7.2.1 Methodological contributions 166
7.2.2 Empirical contributions 168
7.3 Recommendations 174
7.3.1 Recommendations for future research 174
7.3.2 Recommendations for teacher educators 177
8. List of references not included in the articles 180
9. Appendices 188
Appendix 1: supervisors' co-authorship statement 188
Appendix 2: making the research journal available for public scrutiny 189
Appendix 3: sample of narrative account 190
Appendix 4: sample of the first draft of a TBL lesson plan with feedback 197
Appendix 5: progressive evolution of the coding framework for self-reported TBs 202
Appendix 6: reliability test of my analysis of the quality of lesson plans 204
Appendix 7: development of the framework for enacted TBs with the help of critical friends 205
Appendix 8: tool for tracking participants individually from all 3 perspectives on TBs 206
Appendix 9: holistic view on participants based on quantifying the type of change 207
Appendix 10: sample of the coding stripes of participant 12 208
Appendix 11: evolution of the thematic framework after years 1 and 2 219
Appendix 12: density of codes in the final thematic framework 221
Appendix 13: screenshot of one of the framework matrices 236
Appendix 14: screenshot of the general matrix while the mouse is hovering over one cell 237
Appendix 15: example of general matrix structured according to years of teaching experience 238
Appendix 16: CUREC Form 1A 239
Appendix 17: Notice of CUREC approval 252
Appendix 18: Amended CUREC Form 1A 253
Appendix 19: Social Sciences and Humanities IDREC Amendment Form 267
Appendix 20: Notice of approval of CUREC amendment 269
Appendix 21: information sheet for the questionnaire 270
Appendix 22: information sheet for the qualitative strand 271

List of abbreviations

CPD: continuous professional development
IMTPG: Interconnected Model of Teacher Professional Growth
TBL: Team-Based Learning
TBs: teaching beliefs

List of Figures

Figure 1: TBL lesson structure adapted from a diagram by Hrynchak & Batty
Figure 2: the federation's multi-stage educational change effort
Figure 3: structure of the overall argument of the thesis
Figure 4: initial application of Clarke & Hollingsworth´s IMTPG to this thesis
Figure 5: geographical distribution of schools under the federation's umbrella
Figure 6: structure of the termly online mentoring during 2 academic years
Figure 7: methods according to research questions
Figure 8: TBL lesson plans submitted by the 55 participants until the end of the CPD programme
Figure 9: counting on critical friends in the evaluation of lesson plans
Figure 10: examples of the melodies composed by the evolution of constructivist orientation
Figure 11: dendrogram yielded by hierarchical clustering using Ward's method
Figure 12: results of Bonferroni's Post Hoc test
Figure 13: the phases of the analysis answering research questions 3 and 4
Figure 14: development of the thematic framework
Figure 15: dynamics between factors adapting Clarke & Hollingsworth´s framework
Figure 16: screenshot of the first entry on a day during the 3rd academic year
Figure 17: screenshot of a journal entry on the preparation of emails for potential participants
Figure 18: details of the decisions made during the coding-recoding process
Figure 19: conclusions of the coding-recoding process to maximise consistency in findings
Figure 20: structured sequence of actions in a TBL unit, adapted from Michaelsen et al.
Figure 21: structure of the 2-year CPD programme
Figure 22: structure of the termly online mentoring
Figure 23: synergetic approach to data analysis looking for profiles
Figure 24: profiles of teachers according to the evolution of their TBs
Figure 25: structure of the mentoring process
Figure 26: application of Clarke & Hollingsworth´s IMTPG to the school intervention
Figure 27: development of the thematic framework
Figure 28: dynamics between factors adapting Clarke & Hollingsworth’s framework

List of Tables

Table 1: factor loadings for varimax-rotated factor analysis of teachers’ TBs (Arancibia et al., 2020a)
Table 2: coding framework for the evolution of self-reported TBs
Table 3: framework used to elicit the level of constructivist/traditional orientations in lesson plans
Table 4: coding framework for the analysis of the evolution of TBs informing lesson plans
Table 5: a priori coding framework for the evolution of implied TBs
Table 6: audit trail establishing dependability of findings concerning enacted beliefs
Table 7: demographics of participants
Table 8: ANOVA table for the 3-cluster solution
Table 9: M and SD of belief perspectives by cluster
Table 10: teachers across profiles according to type of schooling and career stage
Table 11: three-dimensional typology of factors combining domain, character, and relevance

1. Introduction

1.1 Background, research problem, and research questions

The Spanish educational system has been increasingly informed by the reform effort towards constructivist, competence-led curriculum approaches promoted by the Organisation for Economic Co-operation and Development (OECD). However, my experience as a Spanish teacher, former headteacher, school leader, and teacher educator strongly committed to driving the intended educational change suggests that traditional, content-focused approaches still prevail. As internationally, the impact of this reform movement on what happens in the classroom appears to have been very limited. Due to the persistent lack of agreement across political parties and the resulting succession of educational laws derived from political alternation, Spanish teachers, school leaders, and teacher educators feel left alone and abandoned by the educational administration in the face of the challenge of transforming classroom teaching practices. Within this context of demanding education policy and insufficient official support, I fulfilled my second term of office as the headteacher of my school and in 2014 became the Academic Excellence Coordinator of its umbrella organisation, a federation bringing 22 state-sponsored schools across Spain together with 1,500 teachers in total. As such, I took seriously the responsibility to bring about the educational change towards constructivism intended by the Spanish official education policy, but I had no choice but to develop a bespoke institutional strategy. This strategy would crystalise in a multi-stage, programmatic continuous professional development (CPD) effort under the double assumption that teachers´ teaching beliefs (TBs) influence their teaching practice, and teacher education can promote the development of their beliefs by having them experience the advantages of new teaching practices. Particularly, I focused on the professional development of the over 200 teachers teaching at post-compulsory, secondary level in 11 schools of the federation throughout 8 Spanish regions for the purpose of helping them complement their traditional, teacher-centred lecturing focused on transmitting content with more active, student-centred, competence-led teaching practices.

I first spent the academic year 2015-16 searching for a suitable teaching strategy that could serve as a driver for educational change, and I found Team-Based Learning (TBL), which is an American

university teaching method that provides a structured sequence of activities ensuring the type of active, constructivist pedagogy that I was seeking to promote. Indeed, far from remaining on the surface, TBL is claimed to completely transform the role of teachers and students in the classroom (e.g., Roberson & Franchini, 2014). It is said to make teachers change at 2 moments. Firstly, before classroom time, as they need to think backwards when planning their lessons by starting with the definition of the intended learning outcomes and addressing content and materials in the last place, which entails a dramatic transformation that often challenges their beliefs about teaching (e.g., Michaelsen & Sweet, 2008). Secondly, scholars using TBL contend that in the TBL classroom (Figure 1) teachers become eminently facilitators, genuinely adopting a constructivist, student-centred, competence-led approach. Approach that helps students actively develop new understandings through the experience of solving real-life situations by applying theoretical content collaboratively, making their learning deeper and more significant (Hrynchak & Batty, 2012; Kubitz, 2014).

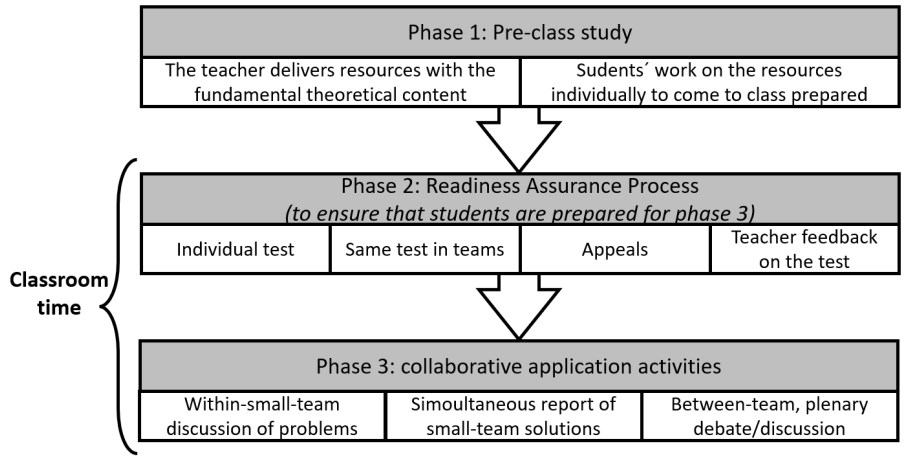


Figure 1: TBL lesson structure adapted from a diagram by Hrynchak & Batty (2012, p. 798)

Some specific features made TBL more suitable for my purpose than other active, collaborative teaching strategies such as Problem-Based Learning: a) TBL provides a more manageable, highly structured sequence of activities (Burgess et al., 2017); b) it is more efficient for educational change, as it requires only one teacher working with all the teams in the same classroom, thus allowing to start change initiatives with just one innovator per discipline (Abdelkhalek et al., 2010; Burgess et al., 2017; Ono et al., 2017; Singh et al., 2018); c) the systematic promotion of inter-team discussions in the same room contributes to enhancing the students' learning experience (Anwar et al., 2012; Okubo

et al., 2012); d) its distinctive instructional sequence enables teachers to ensure that all the fundamental problems are addressed (Vogeltanz-Holm et al., 2014); and e) as peer evaluation and immediate feedback are structural components, TBL maximises student engagement and develops accountability (e.g., Dolmans et al., 2015), allowing teachers to address one of the most recurrent problems of teamwork: the assessment of students' individual performance within their team.

However, while promising, TBL had not been piloted outside of university teaching yet, so I decided to devote my master's degree to rigorously exploring its suitability for post-obligatory, secondary education (Urmeneta, 2018). I first took a year to check its appropriateness for my Baccalaureate philosophy classes, and then I devised an institutional, multi-stage CPD strategy aimed at helping teachers create and pilot TBL units and reflect on their experience. This strategy relied on the progressive iteration of a blended programme combining two-day, face-to-face training on TBL with sustained, personalised mentoring within an online community. Considering the approach to educational change adopted by the only existing experience that used TBL as a driver for change at institutional level (Estis, 2017; Styron et al., 2015), I assumed that the diffusion of change in educational settings does not differ significantly from that in other types of organisations and followed Rogers' (2003) organisational development theory, engaging first `innovators´ (12 teachers) and then `early adopters´ (40 teachers) in the programme. However, while the master's dissertation yielded very encouraging results because participants greatly welcomed the CPD programme as a driver for educational change, the actual potential of the programme for teachers' professional growth was still unclear. As all 52 teachers were assumed to be innovators or early adopters and thus that they volunteered to participate because they were already willing to improve their teaching practice, it might well be that the programme just provided them with an operational tool for applying the beliefs about teaching that they already had, rather than for developing their teaching beliefs. With reservations and doubts, I decided to follow through by engaging the `early majority´ of teachers, those who need to see that the new teaching practice does work before becoming willing to pilot it. I did so under the firm conviction that addressing this problem of practice with rigour in such a multi-school, multi-year intervention could contribute valuable knowledge about the relationship between

CPD, TBs, and educational change. I thus decided to embark on doctoral studies and conduct practitioner research to understand how far the 60 teachers of the `early majority´ covering all career stages and teaching over 15 different subjects at 11 schools across 8 Spanish regions grow professionally and develop their TBs, if at all, in response to the blended, two-year CPD programme developed and implemented by myself within my school federation (Figure 2).

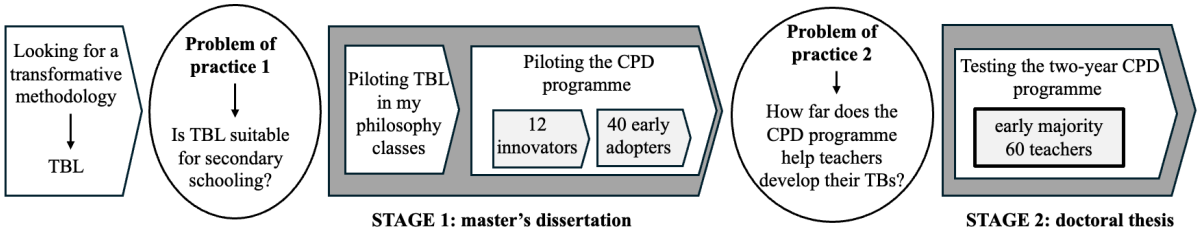


Figure 2: the federation's multi-stage educational change effort

An initial review of the literature confirmed that this problem of practice was a golden opportunity to address a gap in research. Indeed, it showed that focusing on the evolution of teachers' TBs to evaluate the actual potential of in-service teacher education for educational change would be pertinent, as the conviction that teachers' beliefs and practices do influence each other pervades within the field of teachers' beliefs. In other words, scholars overwhelmingly assume that professional development succeeding in helping teachers develop their TBs would lead to a change in their classroom practice and thus to the intended educational change. However, the literature review also showed that the empirical evidence supporting this conviction is still very limited and inconclusive, as longitudinal studies addressing the evolution of teachers´ TBs in response to CPD are scarce, and empirical studies exploring the dynamics of the factors facilitating or inhibiting the intended change in TBs from a generally oriented perspective are virtually non-existent. What is more, it further suggested that these limitations in research derive from the difficulty for scholars to access real school interventions of the scope and nature of that led by me within my institution. This integrated thesis is a longitudinal case study addressing this gap in research. I try to harness the advantages of my position as a teacher educator in order to understand the evolution of teachers' TBs in response to sustained CPD by exploring the following research questions:

1: How did teachers' TBs evolve in response to the two-year CPD programme?

2: How far did this evolution suggest the intended change in TBs, if at all?

3: What factors did influence the evolution of TBs during the programme?

4: How did these factors interact to facilitate or inhibit the intended change in TBs?

1.2 Structure of the thesis

This integrated thesis including 3 publication-ready articles is made up of 9 sections. Section 1 introduces the thesis by addressing its background, its four research questions, and its overall argument. Section 2 presents the 3 theoretical frameworks informing the empirical research: de Vries' et al. (2014) conceptualisation of TBs, Clarke & Hollingsworth's (2002) Interconnected Model of Teacher Professional Growth (IMTPG), and Liu's (2020) aspect-based sentiment analysis. Section 3 concerns methodology and methods. Firstly, it addresses the methodology of the thesis as a piece of practitioner research in the form of a case study. It provides the initial presentation of the multi-school, two-year case under study (which will be completed throughout the 3 articles), highlighting its great relevance concerning the nature of the cases usually addressed within the field of teachers' beliefs and evaluating the robustness of the resulting case study as well as its rigour as a piece of practitioner research. Then, it delves into the mixed-method approach of the thesis, accounting for the methods used for data collection and data analysis to answer the research questions and discussing their ethical implications. Section 4 consists of Article 1, which addresses the implications of my positionality as a practitioner researcher, setting out the strategy followed to maximise rigour through philosophical engagement and digital journaling. The former allows me to underpin the use of mixed methods in an innovative way, whereas the latter enables me to validate my findings by increasing their trustworthiness. Section 5 consists of Article 2, which addresses research questions 1and 2, and Section 6 encompasses Article 3 addressing the remaining research questions 3 and 4. Section 7 draws the final conclusions of the thesis as unitary piece of work, setting out its limitations, discussing its methodological and empirical contributions, and making recommendations for both future research and teacher educators. Section 8 includes the list of the references used in the thesis which are not included in the articles. Finally, Section 9 presents 21 appendices providing additional information for further deepening into some aspects of the thesis.

This thesis is wholly my work in terms of conceptualisation, methodology, investigation, data analysis, and writing. My supervisors provided the usual supervisory support, and would be engaged in the revision, edition, and refinement of the successive drafts of the co-authored articles closer to publication. Appendix 1 includes a statement signed by my supervisors confirming this situation.

1.3 Overall argument

Figure 3 illustrates the progress of the overall argument of the thesis. Article 1 delves into my approach to providing this piece of practitioner research with methodological rigour. I start by reviewing the literature to delve into the nature, the challenges, and the existing frameworks for quality and excellence in practitioner research. Then, I argue why this study is pertinent by showing how practitioner research is particularly suitable and needed within the field of teacher education. After making the nature of my particularly challenging practitioner researcher position explicit, I show how I managed to maximise rigour through philosophical engagement and journaling. Firstly, I set out my previous commitment to an ontological approach, a form of subtle realism contending that, while reality cannot be reduced to meanings that have been socially constructed, it can be known only through them. The researcher is always an insider rooted in reality, rather than an outsider separated from it, which has 2 important implications: a) it leads to an interpretivist epistemology contending that the researcher inevitably shapes the research from a particular position and can only strive for a trustworthy interpretation rather than for disinterested objectivity; and b) it implies that the issue of incommensurability is actually a false problem, thus underpinning the use of mixed methods. Secondly, I examine the conflicts derived from my possible interest in the findings, setting out how I strove to validate them in 2 ways: a) harnessing the advantages of my positionality to increase their credibility; and b) using a digital, reflective research journal to maximise their trustworthiness in terms of transferability, dependability, and confirmability. Appendix 2 details how I will make this research journal available for public scrutiny.

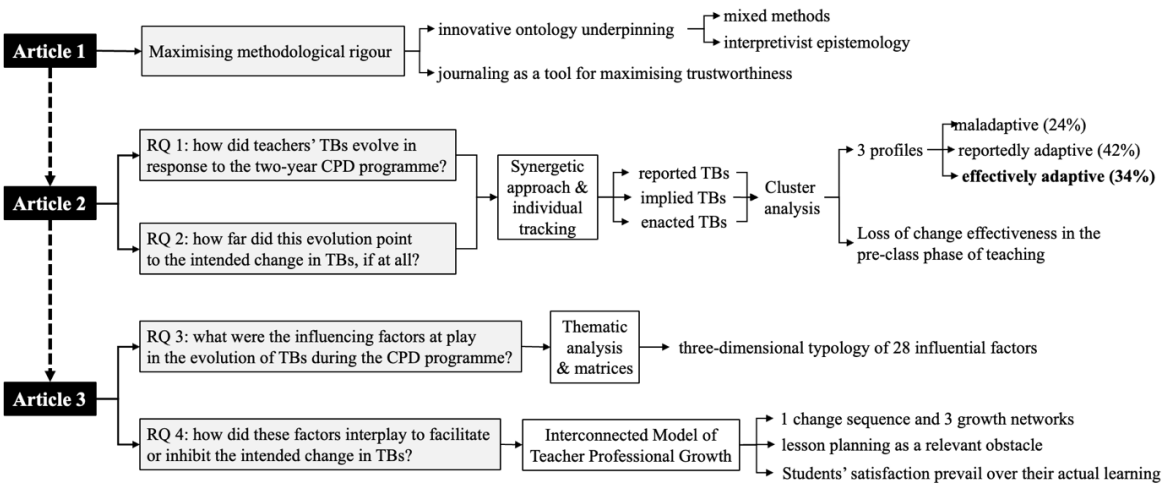


Figure 3: structure of the overall argument of the thesis

Building on the interpretivist epistemology set out in Article 1, Article 2 addresses research questions 1 and 2, exploring how the TBs of the 55 teachers remaining in the organisation during the whole multi-school intervention evolved in response to the two-year CPD programme, as well as how far this evolution did point to the intended change in TBs. In the literature review, I firstly show how research provides empirical evidence supporting that an appropriate understanding of the power of CPD for educational change requires exploring the evolution of teachers' beliefs. Yet, I also contend that the evidence supporting the development of teachers' beliefs in response to CPD is inconclusive, as research into them has some important limitations such as conceptual ambiguity, scarcity of longitudinal approaches, prevalence of small-scale studies, predominance of self-reported data, and unclear relationship with other psychological constructs such as emotions. Then, I focus on beliefs about teaching or TBs as a distinct subset of teachers' beliefs, which orients the teaching method shaping their classroom practices. I show how they have historically been understood using 2 distinct conceptualisations and conclude that their development, while essential to understand the power of CPD for educational change, remains virtually unexplored.

Once I have argued that the literature on teachers' beliefs supports the pertinence of this thesis as an opportunity to address a gap in research, I provide a clear definition of the meaning of TBs assumed in it by drawing on de Vries' et al. (2014) framework. This framework, rather than situating teachers' TBs along a continuum between 2 opposed poles (constructivist and behaviourist), assumes that teachers hold simultaneously 2 distinct teaching belief dimensions which coexist and can combine in

different ways: a constructivist and a traditional orientation. TBs are therefore understood as forms of cognition about how classroom teaching practice should be, of which teachers may or may not be aware but which guide their teaching practice, develop over time, and are structured in 2 distinct, complementary dimensions combining differently in every teacher. Within this theoretical framework, I try to harness the richness of my position as a teacher educator by exploring the evolution of these 2 belief dimensions from 3 complementary perspectives: the TBs reported by participants through a validated questionnaire (self-reported TBs), the TBs implied by their reflections throughout the two-year mentoring process (implied TBs), and the TBs enacted by them in the pre-class, lesson planning phase of teaching through the 244 TBL lesson plans created and piloted during the whole CPD programme (enacted TBs). I track the evolution of these 3 perspectives in every teacher during 2 academic years and code it according to a scale with a continuum of 4 degrees of change, from adaptive to maladaptive. Then, I quantify the resulting ranking by converting the hierarchical order of the codes capturing the degree of change to an ordinal scale that uses numbers: adaptive change (2), slightly adaptive change (1), no or irrelevant change (0), and maladaptive change (-1). A synergetic approach seeking the integration of these 3 perspectives rather than the triangulation between them provides me with a holistic, comprehensive picture of the evolution of every single teacher in the form of 3 variables. These variables, in turn, allow me to understand the evolution of TBs by exploring the possible existence of distinct profiles through cluster analysis.

The findings suggest that teachers' TBs evolved following 3 distinct patterns, as well as that only in one of them concerning one third of teachers this evolution shows the intended change in the TBs enacted when planning the lessons. Indeed, the effectively adaptive profile encompasses the 34.6% of participants who had already a high level of constructivist orientation before the CPD programme, but their teaching practice was still traditional. The CPD programme helped them develop the TBs actually informing their lesson plans in a consistent way, pointing to sustained educational change. The reportedly adaptive profile includes the 41.8% of teachers who found TBL very innovative and experienced it positively. This led them to change their self-reported TBs but not to enact this belief change in their lesson plans, as if change in self-reported and implied TBs did not necessarily lead to

change in enacted TBs or required more than 2 academic years to do so. Finally, the maladaptive profile concerns the 23.6% of teachers who reported a negative change in TBs, experienced the CPD programme negatively and did not develop the intended TBs at all, as if the CPD programme had reinforced the initial predominance of their traditional over their constructivist orientation. A preliminary analysis of the possible existence of associations between these profiles and some demographic variables suggests that the more teaching experience, the more openness to the intended change in TBs. These 3 profiles imply the existence of some factors influencing teaching belief development, some of them ignored by the literature on teachers' beliefs. They hint at the lesson planning phase of teaching as a relevant obstacle, as if the transformative power of in-service teacher education might well be largely lost already before classroom practices. They also imply the impact of teaching experience, prior beliefs, and a significant degree of association with type of schooling (baccalaureate or vocational education teachers).

Once the findings of Article 2 have provided me with an initial understanding of how teachers' TBs evolved in response to the CPD programme and of how far this evolution pointed to educational change, as well as with very initial signs of the existence of 3 factors shaping it, I move to Article 3, arguing the pertinence of enriching this understanding by addressing research questions 3 and 4. Indeed, I show that, while research considers CPD as one of the main sources influencing teachers' beliefs, there is a need for studies exploring the factors that shape this influence. Scholars have listed the most relevant factors driving and hampering belief change in pre-service teacher education, and recent approaches contend the inclusion of affects as one of them, claiming the necessity for a post-cognitivist perspective that does not ignore the role of emotions in belief change. However, studies aimed at uncovering the factors at play in the evolution of in-service teachers' TBs in response to CPD and at understanding how these factors interplay facilitating or inhibiting the intended change, while needed, are virtually nonexistent. Moreover, the relationship between teachers' emotions and beliefs, while essential to satisfactorily account for belief change, remains a gap in research. Arguably, it seems particularly relevant to make the most of this study by identifying all the factors that

influenced the evolution of TBs found in Article 2 and by uncovering their interaction when shaping it, without ignoring the possible role of emotions in this process.

To do so, I critically analyse the existing conceptual frameworks accounting for teacher growth that could serve me as analytical tools and conclude that Clarke & Hollingsworth's (2002) IMTPG seems particularly appropriate for being the only model entirely consistent with the assumptions of this thesis. However, in line with other scholars highlighting that the usefulness of this model requires some adaptations to real-world situations, I justify its adaptation to the features of my intervention, particularly concerning change mediators. Firstly, I argue that enactment as the implementation of something new concerns not only classroom practices, but also the pre-class, lesson planning phase of teaching. Secondly, I contend that re-evaluation represents a third form of change mediator, distinct from enactment and reflection. Thirdly, I theorise that emotions can be integrated into these change mediators as the affective component of reflection and re-evaluation. As a result, I focus on teachers' reflections and comments during the CPD programme and complement the analysis of their cognitive content with the exploration of the emotions implied by the sentiment words included in them using a sentiment lexicon.

To analyse teachers' reflections about their experience with the CPD programme, I followed a four-step analysis. Firstly, I draw on an adaptation of Spencer, Ritchie, O´Connor´s et al. (2014) approach to thematic analysis to develop a thematic framework helping me identify the factors that shaped participants' lived experiences during the 2 years of mentoring process. Secondly, I classify and map these factors according to their domain (personal, external, practice, or consequences), their character (facilitator of, or obstacle to, change), and their relevance (prevalence, insistence, and emphasis in participants comments). Thirdly, I apply Clarke & Hollingsworth's (2002) framework to explore the possible sequence changes and growth networks in which they were involved, if any. Finally, I develop a general matrix to explore the possible association of the factors uncovered with different subgroups of teachers. As a result, I find 28 influential factors structured in 10 overarching groups, develop a three-dimensional typology providing a graphical understanding of their nature, and uncover 1 change sequence and 3 growth networks concerning teachers' TBs. These findings suggest

the centrality of some factors for effective CPD, such as being experiential and directly transferable to teaching practice, as well as providing personal, timely, and sustained mentoring both before and after piloting the new teaching approach. This is consistent with my caution when interpreting the findings of Article 2 as moderately encouraging only, as such features of transformative CPD are extremely resource-consuming, and thus hardly feasible for usual CPD initiatives. The findings also support, and allow to better understand, the influence exerted by the factors already implied by the 3 profiles identified in Article 2 (lesson planning phase, teaching experience, type of schooling, and prior beliefs), apart from suggesting the prevalence of teachers' perception of students' resistance over that of students' actual learning.

2. Theoretical frameworks

I address the research problem by combining 3 theoretical frameworks. I draw on de Vries' et al. (2014) conceptualisation of TBs to explore how participants' TBs evolved in response to the CPD programme, as well as how far this evolution pointed to the intended belief change. Then, I draw on a post-cognitivist adaptation of Clarke & Hollingsworth's (2002) IMTPG to explore the factors influencing this evolution and their interaction when doing so, turning to Liu's (2020) aspect-based sentiment analysis to explore the possible role of emotions.

2.1 The two-dimensional nature of teaching beliefs

The literature has addressed teachers' beliefs concerning different aspects, such as self-efficacy, professional growth, school system, student performance, or teaching method approach (Wang et al., 2024). Regarding beliefs about the best teaching practices, scholars have used different expressions such as 'beliefs about teaching' (Fives et al., 2019), 'beliefs about teaching and learning' (Hancock & Gallard, 2004), 'pedagogical beliefs' (Levin, 2015), 'educational beliefs' (Tondeur et al., 2008) , 'epistemological beliefs' (Gill et al., 2004), etc. This varied terminology may derive in part from the different theoretical frameworks adopted by researchers, and the term TBs used in this thesis has been said to stem from cognitivism and to be usually addressed quantitatively (Mladenovici et al., 2024). In any case, researchers assume that teachers' beliefs about how to teach orient classroom practices (Fives & Gill, 2015; Gibbons et al., 2018; Inan & Bolliger, 2024; Mazhar et al., 2021; Tondeur et al., 2017) and act as filters for the effectiveness of CPD (Buehl & Beck, 2015; Kagan, 1992; Levin, 2015; Nespor, 1987; Pajares, 1992).

It has been said that research into TBs has predominantly adopted a bi-polar approach which argues for a dichotomy between 2 opposing pedagogic 'paradigms' expressed in multiple ways (Fives et al., 2015). The most recurrent polarisation is traditional vs constructivist (e.g., Tondeur et al., 2008), but there are other expressions such as transmission vs constructivism (e.g., Klieme & Vieluf, 2009), student- vs teacher-centred (e.g., Teo et al., 2008), or content- vs student-oriented (e.g., Meirink et al., 2009). This polarised approach assumes that constructivism and direct transmission are the opposing poles of a continuous, single scale where TBs can be ranked in order of closeness to constructivism

(e.g., Purdie & Hattie, 2002). However, recent reviewers have questionned the predominance of this perspective, highlighting the existence of 'much debate in the literature' about the pertinence of this bi-polar approach and a different conceptualisation (Valckx et al., 2021, p. 2). This alternative assumes that teachers have 2 distinct yet complementary belief structures that coexist and combine in different ways (e.g., de Vries et al., 2014). The 2 poles of the dychotomous approach are seen as 2 independent 'dimensions' concerning 'subject matter-oriented beliefs and student-oriented beliefs' (p. 344). The former corresponds to content-centred, 'traditional teaching', and the latter refers to competence-led, 'constructivist teaching' (Tondeur et al., 2008, p. 2544; also Woolley & Benjamin, 2004). In contrast to the bi-polar approach, this perspective is consistent with the empirical evidence that teachers can hold multiple and sometimes contradictory TBs, the activation of which might depend on contextual factors (Cheng et al., 2009; Snider & Roehl, 2007; Verjovsky & Waldegg, 2005).

In this thesis, I adopt De Vries' et al. (2013, 2014) approach to TBs, which is framed within a tradition which, tracing back to Kerlinger & Kaya's (1959a, 1959b) and Woolley et al. (2004) scales measuring attitudes toward education, has used the notion of belief profiles to understand the implementation of modelling in science (Van Driel & Verloop, 2002), the relationship between general and domain-specific beliefs (Van Driel et al., 2007), the use of computers in the classroom (Tondeur et al., 2008), and the differences between the pedagogical approach at two different university types (Vogels, 2009). De Vries' et al. (2013, 2014) understand TBs as 'propositions about learning and teaching that a teacher holds to be true, which in turn guide to her or his thought and behaviors' (de Vries et al., 2013, p. 81). Their conceptualisation builds on 4 pillars. Following Borg (2001), they assume that TBs are truth-oriented, value-laden, concious or unconscious, and behaviorilly influential cognitions. Relying on Bolhuis (2000), Hargreaves (2000), and Kelchtermans (2008), they consider that these cognitions are flexible and develop over time. Based on Murphy & Mason (2006) and Pajares (1992), they infer that, while malleable, TBs become more robust over time. Finally, drawing on Van Driel et al. (2007), Tondeur et al. (2008), and OECD (2009), they contend that teachers simultaneously hold 2 different belief structures responding to 2 teaching method approaches: 'subject matter-oriented beliefs and

student-oriented beliefs' (de Vries' et al., 2014, p. 344). The former conforms a more behaviourist perspective, attaching importance to the 'transmission' of content to be covered by the teacher, who is 'the knowledge expert and deliverer of knowledge' in the classroom, does not encourage students' active participation or collaboration, and prioritises the class as a 'whole' over their individual needs (p. 339). The latter is closer to constructivism, focusing on 'the development of skills and competencies' and considering the teacher as a facilitator who fosters individual learning by encouraging active participation through collaboration (p. 340). Both belief orientations, referred to earlier as traditional and constructivist respectively, correspond to 'traditional teaching' and 'constructivist teaching' (Tondeur et al., 2008, p. 2547; after Woolley & Benjamin, 2004) and may be present with different strengths in every teacher, giving rise to groups or profiles of teachers with 'relatively homogeneous… scores on the two belief scales' (de Vries et al., 2014, p. 347).

This approach has recently been adopted by scholars focused on teacher engagement in professional development (Arancibia et al., 2020b, 2020a; Avalos-Bevan & Bascopé, 2017; Copur-Gencturk & Thacker, 2021; Durak & Topçu, 2025; Farrugia, 2021.; Şentürk & Baş, 2021), teacher-student relationships (Borremans & Spilt, 2022), formative assessment (Forrest, 2018), the relationship between departmental leadership and professional learning communities (Valckx et al., 2024), and relationship of TBs with beliefs about language teaching (Valckx et al., 2021), artificial intelligence (Choi et al., 2023), mathematics (Lane & Ní Ríordáin, 2020) or physics (Belo et al., 2014). However, although it resolves the issue of teachers holding incompatible TBs, which would turn out to be a false problem, it has not yet been implemented to analyse belief change from a generally oriented perspective. Nonetheless, it seems particularly suitable for this study. In contrast to the polirised perspective, it is entirely consistent with the approach to educational change informing the CPD programme under study, which aims to complement the overly teacher-cented, content-focused approach of the school federation with constructivist teaching practices, rather that to substitute the former for the latter. Moreover, the definitions of constructivist and traditional orientations perfectly capture both the legally intended and the actually existing teaching approaches within the Spanish context framing this study. In addition, the multiple combinations of these 2 belief orientations might

enable a finer-grained analysis of belief change, as the approach distinguishing two poles in one single belief scale has been said to be oversimplified (e.g., Niyozov, 2008).

2.2 The Interconnected Model of Teacher Professional Growth

I draw on Clarke & Hollingsworth's (2002) IMTPG because, in contrast to other frameworks mainly focused on addressing inequity (Strom et al., 2023), designing CPD (Evans, 2014) or describing student achievement (Desimone, 2009), its aim is to understand the complexity of belief change. I also excluded Guskey's (2002) linear model contending that change in classroom practice leads to change in student outcomes and this, in turn, to change in teachers' beliefs, as it does not contemplate the cyclic relationship between TBs and teaching practice assumed by the intervention addressed in this thesis. Actually, the IMTPG aligns with this thesis not only in purpose but also in all the features of Boylan's et al. (2018) analytical framework for professional growth models: scope (a specific CPD programme within a school federation), components (its domains perfectly adapt to all the aspects considered by our CPD programme), theory of learning (social constructivism), centrality of teacher agency, as well as theory of learning and philosophical underpinnings (social constructivism). What is more, a preliminary thematic analysis of teachers' reflections after year 1 showed great consistency between the themes uncovered and the domains of the IMTPG.

Assuming that teachers' professional activity concerns 4 distinct 'domains', the IMTPG contends that change or professional growth can occur in every domain and is always the result of different interactions with the rest of them. Figure 4 shows its application to my intervention. The beliefs about teaching held by teachers, along with their attitudes and knowledge, belong to the 'personal domain', where changes are the result of the interaction with different factors situated in the other 3 domains. The 'external domain' refers to the realm located 'outside the teachers' personal world' (p. 951), including educational laws and CPD programmes. The 'domain of practice' concerns teaching practices as well as the methodical innovations piloted by teachers as a result of, for example, their participation in CPD programmes, such as designing TBL lesson plans and implementing them. Finally, the 'domain of consequences' comprises teachers' main interpretations of the results of this practice or its 'salient outcomes' such as, for example, student learning and motivation.

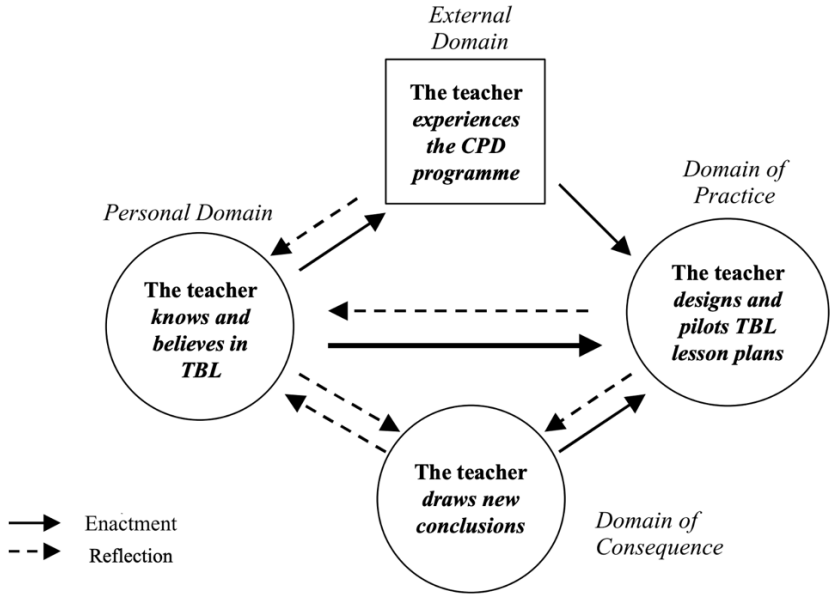


Figure 4: initial application of Clarke & Hollingsworth's (2002, p. 957) IMTPG to this thesis

The transmission of change between domains is conveyed through two processes or 'mediators of change': 'enaction' and 'reflection'. The former is the application of something new, be it a new belief or a new methodology, rather than just doing something as usual. For example, teachers participating in the CPD programme piloted TBL as an innovative teaching practice. The latter is the intellectual effort made by teachers as an 'active, persistent and careful consideration' (Clarke & Hollingsworth, 2002, p. 954; after Dewey, 1910) about what happens in every domain. Within this framework, the interplay between domains can lead to change in one domain only, or in several of them. If the former, there is a 'sequence change', where change tends to be situational and transitory. If the latter, a 'growth network' occurs. This network points to durable change and thus to professional growth.

As analytical tool, the IMTPG has been adapted by researchers for its successful implementation in real-world interventions (da Ponte et al., 2022; Durak & Topçu, 2025; Justi & van Driel, 2006; Lebak, 2015; Lomas, 2018; Wongsopawiro et al., 2017; Zwart et al., 2007), including mentoring processes (Hartnett, 2011). In this sense, I made 3 adaptations concerning enaction and reflection as change mediators. Firstly, as teachers' teaching practice includes both pre-class and classroom activities, the enactment of TBs concerns not only what happens in the classroom but also the lesson planning phase guiding it. Secondly, Clarke & Hollingsworth (2002, p. 954) postulate a particular form of reflective link consisting of 'changes in the teachers' beliefs that lead to a re-evaluation of changes in the domain

of consequence'. I contend that the intervention addressed by this study can be better understood assuming that this 're-evaluation' occurs concerning not only the domain of practice but also the external domain and the domain of consequence. Moreover, I also contend that it can be considered as a change mediator distinct from both reflection and enaction: it consists of implementing beliefs that are in ongoing change during the long-term intervention. For example, I found evidence that changes in TBs happening during the mentoring process led teachers to progressively re-evaluate the suitability of the CPD programme according to the degree of consistency between these changing TBs and their prior TBs: they considered that the programme was a factor whether reinforcing their initial constructivist TBs or changing them towards constructivism. In the same line, I also found an ongoing re-evaluation of the experience piloting the new classroom practice that shows how teachers' evolving self-efficacy with TBL led them to be interested in keeping piloting the new teaching practice or to give up doing so.

Thirdly, the literature review of Article 3 will show the emergence of a tradition emphasising the role of emotions in belief change. Consistently with this tradition, my experience in the previous stage of the CPD programme suggested that teachers' reflective response to professional development was emotionally laden. This led me to align with scholars emphasising the role of emotions in adult learning (Callahan, 2004; Callahan & McCollum, 2002; Chirema, 2007; Cope & Watts, 2000; Cranton, 2006; Cranton & Roy, 2003; Dirkx et al., 2006; Lundgren & Poell, 2016; Malkki, 2010; Scott, 1997; Tisdell & Tolliver, 2001; Yorks & Kasl, 2002), and particularly with Harvey et al. (2019), who found initial empirical evidence that written reflection for learning is both cognitive and emotional. For them, emotions are 'the affective domain' of reflections involving 'subjective experience', which is distinct from thinking or reasoning and can occur at 4 levels of complexity. In my view, the notion of 'reflection' adopted by the IMTPG assumes the 'inattention to the role of affect' that Yorks & Kasl (2002, p. 176) claim to be inherent to American pragmatism, thus remaining 'coldly cognitive' in Gill & Hardin's (2015) terms. I contend that the application of the IMTPG provides a more nuanced understanding of belief change in the intervention addressed by this thesis by assuming that reflection as a 'change mediator' is both cognitive and emotional.

2.3 Aspect-based sentiment analysis

The rigour of methods coding emotions may be questioned, but researchers should not give up exploring them (Saldaña, 2021). Apart from Harvey's et al. (2019) codes focusing on levels of complexity, other taxonomies code emotions according to types (joy, anger, fear, etc.) (e.g., Plutchik, 1980) or to the polarity of positive/negative emotions, also called `sentiments´ (e.g., Mohammad & Turney, 2010, 2013). In being dichotomous, the latter approach seems particularly suitable to elicit the emotional component of teachers' reflections as mediators facilitating or inhibiting the intended change in TBs. Accordingly, I decided to complement my interpretation of the cognitive content of teachers' reflections by turning to sentiment analysis, a research field which emerged in computer science within the context of social media, has spread to social sciences such as economics, and is informing budding post-cognitivist approaches in educational research derived from the need to interpret students' written texts in the COVID pandemic (e.g., Dip & Silenzi, 2024).

Sentiment analysis builds on 'sentiment lexicons', which have been compiled from diverse approaches through different statistical algorithms and list 'sentiment words' implying positive emotions (e.g., hope, brilliant, enjoy) or negative emotions (e.g., doubt, immature, absenteeism). This analysis is interpretive, as the emotion implied by these words are sometimes context-dependant. For example, the same sentiment word might imply opposed emotions, sentiments words not always express any emotion, and some sentences without sentiment words can imply emotions. Particularly, I draw on Liu's (2020) framework, who understands emotions as subjective feelings informing people's opinions and provides methods to elicit the 'positive' and 'negative' emotions (sentiments) implied in written texts, going beyond language units (e.g., sentences) by looking at the contextual aspects targeted by 'sentiment words'. For example, a reflective sentence about the CPD programme could be mixed, suggesting opposed emotions depending on different aspects of the programme, such as in-person training and online mentoring.

3. Methodology and methods

3.1 Methodology: a piece of practitioner research in the form of a case study

Consistently with the particular suitability of case studies for practitioner research (Cohen et al., 2018; after Verschuren, 2003), this thesis is a piece of practitioner research in the form of a single case study (Creswell, 2013) trying to capture the 'complexity and uniqueness' of a real-life intervention (Simons, 2009, p. 21). The description of the intervention under study in this thesis was initiated in the introduction and continues in the subsection below, but the complete analysis of its complex and unique nature will be distributed across articles 1, 2, and 3 from different perspectives. I argue that it is precisely the scope of this complexity and that of the effort made to provide the research with methodological rigour what makes this case study particularly robust.

3.1.1 The case: a multi-school, multi-year intervention

The case under study is a multi-school, two-year intervention embedded within a long-term, multi-stage educational change effort of a Spanish state-sponsored school federation. This federation was founded in 1992 to progressively take in catholic schools that religious institutions would not be able to maintain any more. The intervention covers the academic years 22-23 and 23-24 and includes 60 teachers of the 11 schools with post-obligatory, secondary education under the umbrella of the federation. As these schools are spread across Spain in 8 different political regions (Figure 5) with very different climates, cultural backgrounds, and even co-official languages, many educational policies are significantly different. While homogeneous in terms of race and gender, they are diverse in terms of family background, size, rural or urban location, leadership styles, and even origin, as they joined the growing federation at different moments coming from different religious institutions. The teaching staff is also diverse, as there are different degrees of both sense of belonging to the federation and predisposition to professional development.

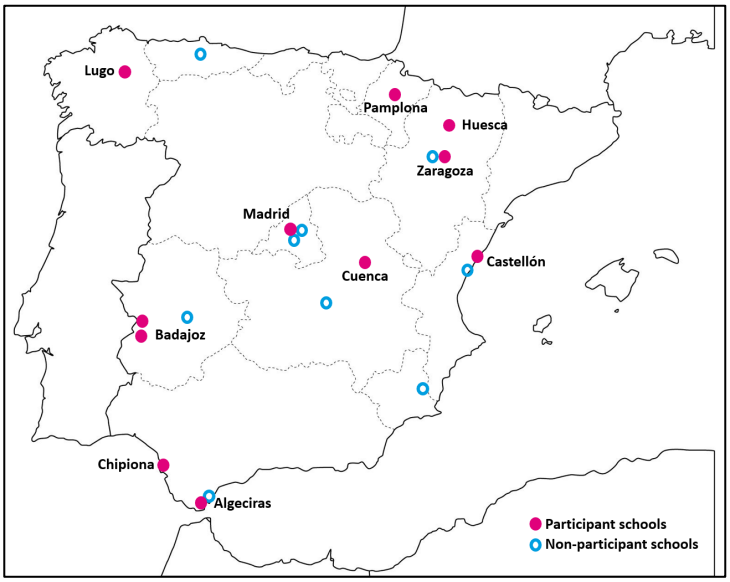


Figure 5: geographical distribution of schools under the federation's umbrella

The recruitment of participants in the research built on previous educational change initiative in the school federation, so that teachers in that were potential participants in this research. They were supposed to belong to the 'early majority' and were enrolled in a two-year institutional CPD programme as their form to meet the professional development requirements that are compulsory for every teacher at the school federation. Participants in the research were voluntarily recruited from this group of potential participants, who were selected implementing the following institutional strategy.

The size and multi-site nature of the federation led its Steering Committee to involve school headteachers in the design of the CPD programme, taking the following three steps at a regular, in-person meeting with them in Madrid. Firstly, to create the 'sense of urgency' and show a strong institutional commitment, which are two of the eight principles for successful organisational transformation (Kotter, 2012, p. 4), the Head of the federation informed them about the scope of the programme, highlighting the strategic necessity to pilot it at scale across the institution. Secondly, as the teacher educator, I presented the criteria to select the 'early majority', emphasising that we were looking for teachers who were open to change but, in contrast to innovators and early adopters of previous stages of the institutional change effort, only after they see evidence that the new teaching practice did work well. Finally, the Head of the federation told the headteachers that the teachers selected would be held accountable for their performance and commitment to them, which was

essential to build my non-evaluative, non-executive, fully supportive role as the teacher educator of the programme. As a result, a total of 60 teachers were identified, selected, and informed about the nature of the programme by their headteachers months before the initial face-to-face training held in Madrid. This group of 60 potential participants were invited to participate in the case study after the initial face-to-face training.

The role played by headteachers during the CPD programme could have some impact in two ways. Firstly, it could affect the appropriateness of the initial selection of potential participants in the research as representatives of the 'early majority'. Moreover, and more importantly, headteachers' leadership style could have some influence on participants' commitment and performance during the programme (Day, 1999; Fullan, 2015; Harris & DeFlaminis, 2016). The evaluation of the possible impact of different aspects of the varied school contexts and particularly of leadership was beyond the scope of this research, thus representing one of its limitations.

The CPD programme was blended, including 2 parts. The first part consisted of a compulsory face-to-face, two-day training held in Madrid for participants to gain an understanding of the principles underpinning TBL. In it, they underwent the learning experience provided by this constructivist teaching practice as if they were students. They also started the design of their first TBL lesson plan under my supervision. As designing lessons backwards is essential in TBL, and teachers' enaction of their TBs already starts in the lesson plans guiding their teaching practice, the second part added a voluntary, institutionally recommended series of cycles of timely, personalised mentoring for the design and implementation of termly TBL lesson plans within an online community. The 60 participants had an individual, while not private, channel within the community hosted on the institutional Microsoft Teams, where they shared their lesson plans, provided their reflections, and received my feedback (Figure 6).

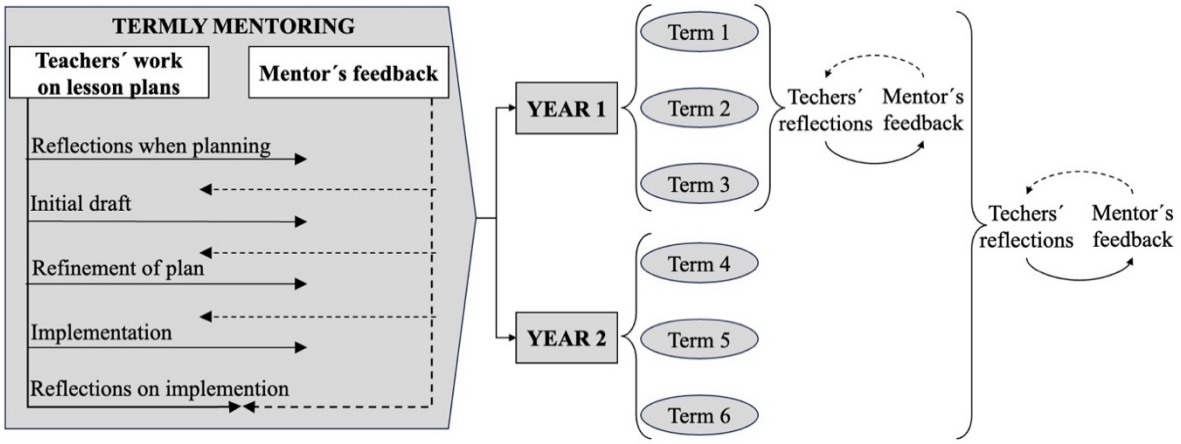


Figure 6: structure of the termly online mentoring during 2 academic years

This structure of planning, implementing, and reflecting on lessons of this mentoring process shaping the second part of the blended CPD programme may be seen as a form of Instructional Coaching. Instructional Coaching is used by US policymakers to promote the improvement of primary and secondary student achievement 'through site-based, individualized, and sustained professional development' (Desimone & Pak, 2017, p. 3) providing 'real time, ongoing feedback' (p. 6). More particularly, it resembles Knight's (2017) instructional coaching cycles including three phases: pre-class planning, classroom observation, and post-observation reflection. It also resembles to some extent the cycle of 'planning, observing, and reflecting on a lesson' followed by the Lesson Study approach (Bucher *et al*., 2026, p. 1; after Lewis et al., 2019), which originated in Japan and 'has been adapted to fit diverse national and local contexts' (Kager et al., 2023, p.1). However, while taking place within an online community with shared resources to create the conditions for a prospective community of practice of teachers who interact regularly to learn how to improve their practice (Wenger, 1998), the mentoring process was mainly focused on fostering participants' individual interaction with me as the mentor, rather than collaboration between them.

3.1.2 Robustness of the case study

3.1.2.1 Scope

Some scholars within the field of teachers' beliefs remark that single case studies are not 'robust enough to further our understanding of the development of teachers' beliefs', pointing to the necessity of 'multiple case studies… asking the same research questions in many different settings' (Levin,

2015, p. 61). However, the scope of this 'single' multi-sited case study appears to make it particularly robust for three reasons. Firstly, it addresses the very same CPD programme and the same research questions in 11 different settings with different backgrounds throughout Spain. Secondly, in contrast to most case studies, which use 'discrete courses as the principal context for belief change', this case study addresses a consistent, two-year intervention embedded in a wider institutional 'programmatic effort' (Tatto & Coupland, 2003, p. 177). Using Chong & Graham's (2013) Russian doll metaphor, the macro-context would be the institutional educational change effort, the meso-context would be the multi-stage CPD programme, and the micro-level would be the two-year intervention addressed by this study.

Thirdly, while case study is the most widely used qualitative approach to teachers' beliefs (Olafson et al., 2015), only very few of them address school interventions as long as that addressed by this thesis, and none of them include as many participants (Achinstein & Ogawa, 2011; Deal & White, 2006; Wyatt, 2010). In this sense, the sample of 60 initial participants provides this case study with unusual robustness, as 'the most problematic' weakness in the field is that 'most research on teachers' beliefs consists of small-scale case studies (typically of one to four teachers)' (Levin, 2015, p. 59). Also in this sense, the two-year duration of this case makes it particularly strong, as longitudinal studies on teachers' beliefs are needed (e.g., Fives & Gill, 2015) and, while there is no unanimity, 'a minimum of nine months of fieldwork is suggested for an educational study to be considered longitudinal' (Saldaña, 2003, p. 3). Moreover, my position as a practitioner researcher was advantageous because 'teacher education programs and professional development are ideal settings for longitudinal studies of how teachers' beliefs and practices develop over time' (Buehl & Beck, 2015, p. 79). This position helped to make the study robust in allowing me to address some of the specific challenges posed by longitudinal studies (Cohen et al., 2018): a) staff turnover at the school federation tends to be minimal, and attrition could be reduced to teachers reluctant to maintain their consent to participate, which in turn was minimised because I had personalised access to all participants (e.g., Mallick & Verma, 1998); b) longitudinal studies tend to be expensive (Ruspini, 2002), but this case occurred naturally, and my position as practitioner researcher avoided spending additional money; and c)

problems of internal validity derived from ‘the exposure of repeated testing/interviews’ over time (Cohen et al., 2018, after Ruspini, 2002) were minimised by making the most of the data naturally gathered as the teacher educator of the multi-school intervention.

3.1.2.2 Generalisability

Case studies allow generalisation because, just as experiments need for multiple replications, so they ‘can be part of a growing pool of data, with multiple case studies contributing to greater generalizability’ (Cohen et al., 2018, p. 380; after Ruddin, 2006; also Macpherson et al., 2000; Pring, 2015; Robson, 2002; Simons, 2015; Thomas, 2010; Thomas & Myers, 2015; Verschuren, 2003; Watts, 2007; Yin, 2009). They can help to understand similar cases (Nisbet & Watt, 1984) and ‘can be conducted in order to inform decision making by policy makers, practitioners and theorists’ (Cohen et al., 2018, p. 377, after Bassey, 1999). In this sense, this case study might allow for generalisation at 3 levels: a) ‘from the single instance to the class of instances that it represents’ (Cohen et al., 2018, p. 381), as it can be used as a valid example of how the effectiveness of teacher education can be evaluated from an inclusive perspective taking teachers’ beliefs and lived experiences into account ; b) ‘from features of the single case to a multiplicity of classes with the same features’ (p. 381), as it provides some evidence about the extent to which other local transformative initiatives could initiate non-superficial change; and c) ‘from a single case to a theoretical extension or theoretical generalization’ (p. 381), as it provides an ecological perspective allowing to better understand how long-term CPD can contribute to the development of teachers’ TBs.

3.1.2.3 Reliability and validity

There are some aspects that can affect the reliability and validity of case studies. The reliability of this case study has been built up in 2 ways: a) ensuring internal consistency between its different sections; and b) providing a detailed description of the case to facilitate its transferability. Moreover, it addresses all the validity dimensions highlighted by Cohen et al. (2018): a) ‘construct validity’, by providing a clear definition of teachers’ TBs and of belief profiles; b) ‘internal validity’, by inferring the interpretation about teachers’ beliefs from the data in a transparent way; c) ‘external validity’, by specifying and clarifying the fields of research in which the study can make a contribution; d)

'ecological validity', by paying special attention to contextual factors and details; e) 'concurrent validity', by combining multiple types of data and different perspectives on TBs; and f) 'avoidance of bias', by making my position explicit and striving for trustworthiness through reflexivity. Furthermore, it is true that the 'veracity' of the data gathered in case studies within the field of teachers' beliefs is questionable because they are usually collected as 'coursework' fundamentally 'intended to assign grades' (Gilles & Fives, 2015, p. 7). However, this is not the case of this study, as data were naturally collected as part of the CPD programme to provide support and advice, rather than to assign grades.

3.1.3 Rigour in practitioner research

In Subsection 4.2 in Article 1 argue in detail why practitioner research is an umbrella term that lacks unanimous definition and blurs terminologically, conceptually and in terms of purpose. This thesis aligns with scholars contending that it is type of research that uses 'practice as a site for research' (Cochran-Smith & Donnell, 2012, p. 507) and that, when excellent, it produces valuable knowledge that can be relevant and informative beyond practitioners' particular contexts (Finch, 2022). They contend that, when excellent, practitioner research can 'contribute to reliable public knowledge about both method and theory' (BERA, 2018, p. 3) and have developed varied frameworks to operationalise methodological quality and maximise rigour from different traditions and approaches (Bullough & Pinnegar, 2001.; Cochran-Smith & Donnell, 2012; Dana & Yendol-Hoppey, 2020; Eisenhart & Howe, 1992; Finch, 2021, 2022; Hammersley, 2008; Heikkinen et al., 2007, 2012, 2016; Herr & Anderson, 2015; M. Levin, 2012; Oancea & Furlong, 2007; Zeichner & Noffke, 2001). In this vein, this thesis follows the recommendations for future research made by scholars within the field of teacher education who highlight the 'need for teacher educators to be at the forefront of research´ (Mayer et al., 2017), pointing to the particular suitability of `practice-oriented studies that engage practitioners in the production of research' (Mayer & Oancea, 2021).

In terms of rigour, however, my practitioner researcher position is particularly challenging: I am a teacher educator researching my own practice within my own organisation with possible interests in the findings concerning an intervention designed, promoted, implemented, and led by myself. Even

unintentionally, the findings might well be shaped by an unconscious interest in using the research to support and justify my pedagogical convictions, in urging other organisations to adopt the CPD programme, in enhancing my professional reputation, or in improving my institutional position. I will set out my strategy to address this challenge in Article 1 (section 4), making the most of the above-mentioned frameworks for methodological quality in order to maximise the rigour of this piece of practitioner research, and thus to contribute valuable knowledge and relevant findings. This strategy aligns with scholars contending that objectivity is not 'an aperspectival faithfulness to brute facts' (Stamenkovic, 2023, p. 277), which would respond to a 'distortingly "normative" idea of social scientific objetivity' (Montuschi, 2004, p. 109). It assumes that rigour and objectivity concern honest 'evaluative' interpretations rather than 'disinterested' descriptions gained through 'impersonal detachment' (Bird, 2020). In this sense, I focus on the trustworthiness of the research, which is a measure of quality and rigour widely used within the field of teacher education (Heikkinen et al., 2016; Vanassche & Kelchtermans, 2015) but less attended than others in practitioner research (Finch, 2021). Particularly, I strive to maximise the credibility, transferability, dependability, and confirmability of my findings.

3.2 Methods

3.2.1 Methods and research questions

3.2.1.1 Mixed-method approach to research questions 1 and 2

To address the research problem, I adopted different methods of data collection and data analysis, depending on the research question (Figure 7). Particularly, I mixed methods to answer research questions 1 and 2. It is true that the issue of paradigm incommensurability between qualitative and quantitative methods is a huge philosophical problem informing social research (e.g., Cohen et al., 2018). However, it has been challenged by some researchers (e.g, Creswell & Tashakkori, 2007) who commonly turn to either philosophical pragmatism (Tashakkori, et al. , 2020) or critical realism to underpin mixed methods. I align with scholars contending that this is a false problem (e.g. Pring, 2015) and support the use of mixed methods without drawing on any of them. As Article 1 will show in the next section, Xavier Zubiri's (1980, 1982, 1983, 1999) middle-ground ontology suggests that

the issue of incommensurability is the result of a historical misconception of knowledge and reality. From a Zubirian perspective, there is neither ontological nor epistemological conflict challenging mixed-methods, and both quantitative and qualitative approaches provide equally interpretive perspectives on reality which neither transcend our apprehension nor can be reduced to a simple construction of the subject.

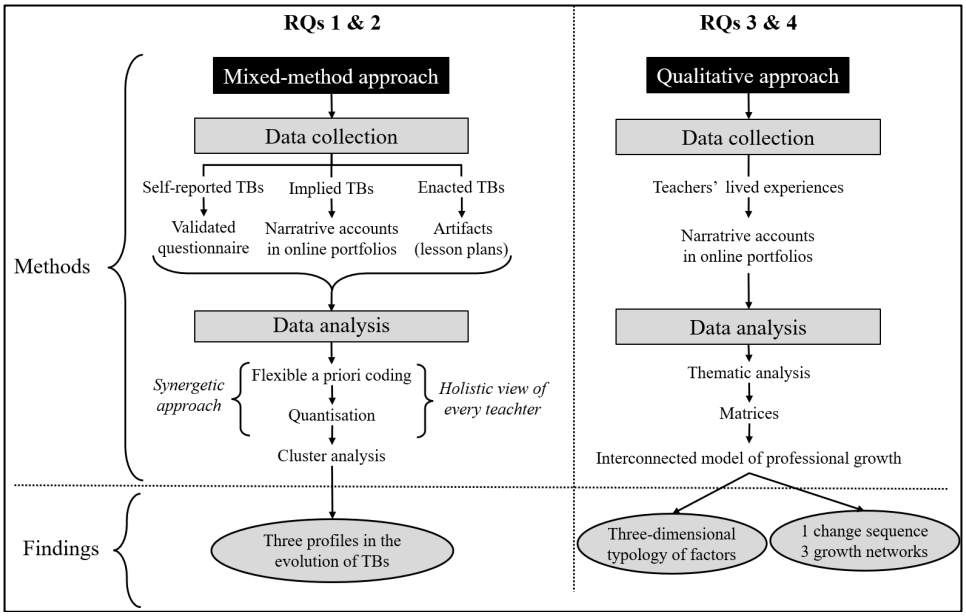


Figure 7: methods according to research questions

In terms of data collection, this mixed-method approach has epistemological, methodological, practical, and ethical reasons. Epistemologically, TBs are subjective, particularly elusive constructs which cannot be directly observed by researchers and must be indirectly inferred and elicited from teachers (Tatto & Coupland, 2003; Pajares, 1992; Fives & Buehl, 2012). This is why scholars within the field of teachers' beliefs recommend combining as many data collection approaches as possible to enable it, and mixing methods is seen as a great asset, particularly when addressing belief development (Schraw & Olafson, 2015; Levin, 2015; Fives & Buehl, 2012). It is true that this combination of methods and approaches to data collection cannot provide access to teachers actual TBs, which will always remain private, but it allows to gain a more nuanced, comprehensive elicitation of how they might be and evolve. Methodologically, rigorous practitioner research has been said to require the collection of multiple data types, (Cochran-Smith, 2005; Oancea & Furlong, 2007; Wyse et al., 2018), which provides research with 'concurrent validity' (Cohen et al., 2018, p. 381). As

a result, I tried to harness the advantages of my position by inferring teachers' TBs from three different perspectives: a) teachers' self-appraisal of their own TBs (self-reported TBs); b) their reflections on their lived experiences with the CPD programme (implied TBs); and c) their pre-class action when designing TBL lesson plans (enacted TBs). Yet, practicalities suggested the use of a questionnaire to collect teachers' self-appraisal, as the number of participants and the multi-site nature of the intervention made interviewing hardly manageable. Moreover, in ethical terms, using a questionnaire was the least intrusive method to have teachers explicitly report their own TBs; it did not affect their educational experience and provided a happy medium in the 'inherent tension in blending research and teaching' that is usual when studying teachers' beliefs (Gilles & Fives, 2015, p. 7) and was applicable to my position as a practitioner researcher. Indeed, if the role of teacher educator prevails, the data collected may be unsuitable in responding to professional necessities instead of being theoretically informed, whereas if the role of researcher prevails, the collection of data may be ethically questionable in subordinating teachers' educational experience to the research. In this study, however, data were naturally collected as part of the intervention using instruments theoretically informed by the literature review. Only the quantitative data collection required additional effort from participants, but the questionnaire used to elicit participants' self-appraisal was non-intrusive and non-detrimental to their educational experience. All the data were gathered from the same teachers during the whole CPD programme. Qualitative data were collected steadily throughout the two-year intervention, whereas the collection of quantitative data took place only at three points in time (before year 1, after year 1, and after year 2). However, there was no specific sequential order between both strands.

In terms of data analysis concerning belief development, 'sequential explanatory mixed methods studies about teachers' beliefs are recommended' (Levin, 2015, p. 62). In this sense, I might have considered prioritising the quantitative strand (self-reported TBs) over the qualitative one (implied and enacted TBs), as participants' explicit self-appraisal could appear to have more veracity than my interpretations of their comments and lesson plans. However, the former does not have to be more reliable than the latter because, when answering a questionnaire, teachers might be willing to provide

just socially desirable answers, unwilling to share their beliefs, or even unable to articulate them, which may in turn be unconscious. This balance in reliability terms suggested the adoption of a 'convergent, parallel design' (Creswell & Plano Clark, 2017), in which 'quantitative and qualitative data are collected and analysed separately and then put together' (Cohen et al., 2018, p. 38). When doing so, I followed Day's et al. (2008) mixed- method approach, seeking synergy rather than triangulation: instead of looking for consistency between the 3 perspectives, I integrated the facets provided by them in a more holistic, organic understanding that would allow me to explore the possible existence of groups of teachers showing similar evolution in their TBs from all three perspectives.

3.2.1.2 Qualitative approach to research questions 3 and 4

In contrast to this mixed-method approach to research questions 1 and 2 in Article 2, I adopted a qualitative approach to research questions 3 and 4 in Article 3. This was so because, in terms of data collection, I focused on participants' comments and reflections made during the mentoring process within the online community so that I was able to elicit their lived experiences with the CPD programme. In terms of data analysis, I used some quantities and percentages to explore the association of the factors uncovered with some demographic variables, but data were not 'analyzed primarily through formal, mathematical, or statistical techniques' (Small, 2011, p. 72). Rather, they were analysed by drawing on an adaptation of Spencer, Ritchie, O´Connor's et al. (2014) approach to thematic analysis, and the factors uncovered through this analysis were then interpreted in the light of Clarke & Hollingsworth's (2002) IMTPG.

3.2.2 Methods for data collection

3.2.2.1 Teachers' self-report of their TBs

Teachers' self-reported TBs were the only perspective that did not occur naturally as part of the CPD programme. To elicit them in the least intrusive way, I used an adaptation of Arancibia's et al. (2020a, 2020b) version of de Vries' et al. (2013, 2014) reliable, validated questionnaire allowing the identification of the levels of the traditional and the constructivist orientations. This version translates

the original Dutch into Spanish and adapts the four-point rating scale to a finer-grained, six-point Likert scale, more suited for the detection of smaller variations. They conducted an exploratory factor analysis to confirm the validity of the questionnaire with a sample of 641 Chilean professors, confirming the existence of 2 scales which proved to be highly reliable, with Cronbach's α = .89 and α= 0.86 respectively, a bit higher than the α = .84 and α = .80 of the original questionnaire (Table 1).

Table 1: factor loadings for varimax-rotated factor analysis of teachers' TBs (Arancibia et al., 2020a)

	Questionnaire items	*f* 1	*f* 2
Traditional TBs (α = .89)			
1	I pass on my subject matter to the students	0.88	
2	The content of my lessons is good	0.84	
3	Students acquire knowledge	0.83	
4	Students really listen to what I´m telling them	0.81	
5	There is order and discipline during the lesson	0.61	
6	Students learn the content of my subject matter	0.83	
Constructivist TBs (α= 0.86)			
7	Students learn how they can best learn my subject matter		0.66
8	Students learn autonomously to solve problems concerning my subject matter		0.67
9	Students, where relevant, learn cooperatively in groups		0.74
10	Students develop their skills and competences		0.78
11	To relate to the students´ own knowledge and experiences		0.77
12	To take into consideration the differences in aptitudes and interests between students		0.77
13	*To integrate the latest developments in the field of my subject matter in my lessons*		*0.63*
14	*Students work actively at my subject matter*		*0.62*

Notes: *f*1 = traditional orientation, *f*2 = constructivist orientation

I adapted this questionnaire in 5 ways. Firstly, I retook 3 features of the original version: a) I removed items 13 and 14 because they loaded in the 2 belief scales in de Vries' et al. (2014) version and still require further validation, giving rise to a 12-item questionnaire; b) to encourage teachers' realistic answers, I included the introductory stem ('In my teaching, …') and the verb 'is' introducing each one of the six Likert scale options; and c) following de Vries et al. (2014), I randomised the order of the items to minimise socially desirable answers. Moreover, in the baseline questionnaire, I included 4 demographic questions addressing gender, years of teaching experience, main discipline, and type of education (baccalaureate or vocational education). Finally, I adapted the questionnaire to the institutional culture and language of the school federation to ensure that participants understand all the

items appropriately by collecting the opinion of 35 secondary teachers of the organisation who were not potential participants in the questionnaire and held different positions within the school federation.

The questionnaire was administered 3 times (baseline, after year 1, and after year 2) to a population of 274 secondary teachers from the 11 participant schools. To encourage participation and allow individual tracking, I sent a personalised email to their institutional address and used a different copy of the questionnaire for every participant. This made it possible to track teachers individually but impossible to guarantee complete anonymity. Nonetheless, all the steps were taken to ensure confidentiality and to anonymise participants during the data processing. In total, the 82.5% of the initial population completed both the baseline and the after-year 2 questionnaires (226 teachers), which is markedly higher than the average response rate for an online survey (Sheehan, 2001). As I will show in Article 2, the sample included 2 subsamples to enable comparisons with a sort of comparison group: the 55 participants who completed the CPD programme out of the 60 teachers initially enrolled, and another 171 teachers who were not included in the programme. The gender distribution of the whole sample mirrored the proportion at the school federation, and the average teaching experience when the CPD programme started was 18.9 years (SD = 9.43), ranging from 1 to 40 with the following distribution according to Huberman's (1992) teacher career cycle: 4.4 % had 1-3 years, 6.6% had 4-6 years, 34.5% had 7-18 years, 37.2% 19-30 years, and 16.4% had more than 30 years of experience, virtually mirroring the distribution provided by de Vries et al. (2013) in their study. Approximately one-third of participants (35.8%) taught STEM disciplines, whereas the other two-thirds taught other disciplines such as History, Philosophy, etc (64.2%). These statistics of the whole sample resemble the national teaching staff distribution in the Spanish secondary education (Ministerio de Educación y Formación Profesional, 2022). Moreover, the 14.7% of participants were vocational education teachers, whose students aim to join the job market, whereas the remaining 85.3% were baccalaureate teachers, whose students want to go to university and need to pass an external exam. The distribution of participants across the 11 schools was quite well balanced, as every school contributed about the 10% of participants except two of them contributing the 6% each.

3.2.2.2 Teachers' comments and reflections during the CPD programme

The findings of my master's dissertation had already shown that participants' comments and reflections on their experience with the CPD programme were a privileged scenario to explore their beliefs. They were a golden opportunity for me to infer teachers' TBs from a different perspective in research questions 1 and 2 (implied TBs), as well as to uncover the factors influencing the evolution of these TBs and their underlying dynamics in research questions 3 and 4. Actually, their occurrence in the individual channels used within the online community in the form of different conversation threads during the mentoring process could perfectly represent a sort of self-reflective writings in electronic portfolios, which are 2 of the most frequently used qualitative data collection instruments within the field of teachers' beliefs (Hoffman & Seidel, 2015; Schraw & Olafson, 2015). Accordingly, once the CPD programme ended after year 2, I copied the conversation threads and pasted them in 55 Microsoft Word files with 8 pages on average, following the chronological order, including the date and time of every comment, and anonymising participants. These files constituted unitary, meaningful reflective narrative accounts gathered through weblogs. Appendix 3 provides a sample of narrative account.

3.2.2.3 Teachers' pre-class action in the form of lesson plans

Scholars within the field of teachers' beliefs usually conduct observations of classroom teaching practices to address participants' performance in response to teacher education. However, they were not part of the CPD programme; live observations of 55 teachers were hardly feasible in a multi-site intervention spread across Spain, and videotaped ones would be particularly intrusive and problematic in terms of anonymity and confidentiality (Saldaña, 2003), requiring additional logistic support. Even so, I realised that participants' action was also captured in their designs of the termly TBL lesson plans, where they projected their TBs unconsciously. As gathering artifacts can be helpful in case studies (Yin, 2009), and lesson plans have already been used in longitudinal studies addressing belief change in prospective secondary teachers (Fletcher & Luft, 2011), I realised that the initial draft of the termly TBL lesson plans submitted by participants would give me the opportunity to address the third perspective: enacted TBs. As shown in Figure 8, participants designed and piloted 244 TBL lesson

plans out of the 330 expected, although the level of engagement was unequal between participants, and the number of plans submitted diminished progressively (142 in year 1, and 102 in year 2). The demographics of participants are detailed later in Article 2. Appendix 4 shows a sample of the first draft of a TBL lesson plan with my feedback.

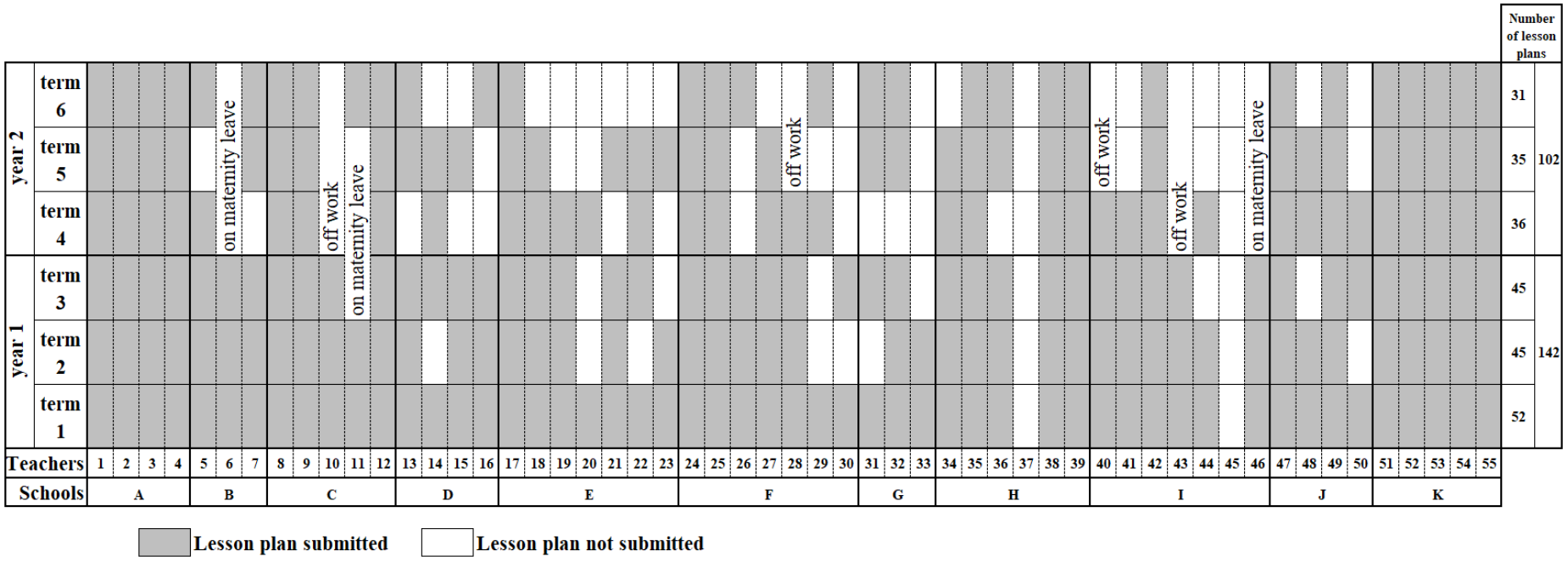


Figure 8: TBL lesson plans submitted by the 55 participants who remained in the school federation until the end of the CPD programme

3.2.3 Methods for data analysis

3.2.3.1 Research question 1 & 2: flexible a priori coding, quantification, and cluster analysis

My strategy to data analysis concerning research questions 1 and 2 aimed to make the most of my opportunity to engage with participants individually in a sustained way. As I anticipated earlier, I was convinced that the adoption of a person-centred approach seeking the synergy between the 3 perspectives on TBs that were adoptable by me instead of triangulation between them would provide a more organic, holistic understanding of the evolution of the TBs of every single participant. Accordingly, I followed Day's et al., (2008) synergetic approach and conducted the analysis in 2 phases. Phase 1 was aimed at capturing the evolution of TBs from every perspective in the form of quantitative variables, so that I could integrate them in a holistic picture in every teacher. To do so, I used flexible a priori coding and quantification, translating the hierarchical order of the codes capturing the degree of change into numbers in an ordinal scale. Phase 2, in turn, was aimed at exploring the possible existence of profiles or patterns across these individual pictures, so that I could better understand how participants reacted to the CPD programme. To do so, I conducted cluster analysis.

3.2.3.1.1 Phase 1: flexible a priori coding and quantification

In Phase 1, I turned to 'deductive coding' because 'a design that tests theory against empirical data requires pre-set codes' (Elliott, 2018, p. 2855). However, the development of these codes proved to be particularly complex. Indeed, to enable a synergetic approach, I needed to ensure that the picture provided from every perspective on TBs would be easily integrated in a holistic view and intuitively comparable with the rest of them. Thus, I opted for developing homogeneous coding frameworks that consider the same types of evolution in every perspective on TBs. As the change provoked by CPD programmes can be 'adaptive' or 'maladaptive' (Girardet, 2018, p. 6; also Buehl & Beck, 2015), meaning the intended one or its very opposite, a minimum of 3 codes was necessary. I initially considered a more nuanced distinction of 6 codes to identify small variations (3 for adaptive change, 1 for no change, and 2 for maladaptive change). Yet, in the process of pilot testing and sensitivity analysis after year 1, I found the seven-code approach unsuitable and proceeded with its progressive

refinement to the final four-code framework, ranking them according to the same scale with a continuum of 4 degrees of change, from adaptive to maladaptive. Then, I quantified the resulting ranking by converting the hierarchical order of the codes capturing the degree of change to an ordinal scale that uses numbers: adaptive change (2), slightly adaptive change (1), no or irrelevant change (0), and maladaptive change (-1). Moreover, to make these codes operational and helpful to understand the evolution of TBs, I needed to develop coding frameworks defining their meaning with precision. To do so, I followed Corbin & Strauss´ (2015) framework, considering them as categories with properties and dimensions. It is true that the deductive approach underlying a priori coding as well as my interpretive epistemological assumptions differ from those underpinning grounded theory, but 'it is not necessary to share Strauss's worldview or assumptions to use this methodology' (Corbin & Strauss, 2015, p. 17). Nonetheless, this deductive approach to coding turned out to be flexible, as new codes might emerge during the research process (e.g., Creswell & Poth, 2018), and thus the coding frameworks were refined even during the data analysis phase. Appendix 5 shows how the codes, their definition, and the scale for their quantification in the framework for self-reported TBs were progressively refined over time.

3.2.3.1.1.1 Self-reported TBs: teachers' self-appraisal

Firstly, I calculated the level of the traditional and constructivist orientations at baseline and after year 2. Then, I applied the coding framework shown in Table 2. Subsection 5.6.2.4 in Article 2 will provide additional information about the reason why the properties primarily focused on changes in the level of the constructivist orientation, whereas dimensions concerned the consistency of these changes across the 3 measurements.

Table 2: coding framework for the evolution of self-reported TBs

CATEGORIES	PROPERTIES	DIMENSION	Quantification
	Level of belief orientations concerning baseline	**Consistency across the 3 measurements**	
Adaptive change	Higher constructivist orientation	After year 1 and year 2	2
Slightly adaptive change	Higher constructivist orientation	After year 2 only	1
	Constructivist orientation remains at the maximum level	After year 2	
No change	Same constructivist orientation	After year 2	0
	Lower constructivist and traditional orientation		
Maladaptive change	Lower constructivist and same/higher traditional orientation	After year 2	-1

3.2.3.1.1.2 Enacted TBs: lesson plans

My experience in the previous stage of the institutional educational change effort suggested that I would be able to infer the evolution of the constructivist and traditional orientations guiding participants' classroom practice if I was able to elicit the TBs enacted by them in the pre-class lesson planning phase, in the initial drafts of the TBL lesson plans created by them, as they were not yet influenced by my feedback as a mentor. To do so, however, I needed to develop an appropriate interpretive tool, given my possible interests in the findings of the research. To face this challenge, I tried go beyond transparency and reflectivity by drawing on 7 critical friends in 2 different steps (Figure 9).

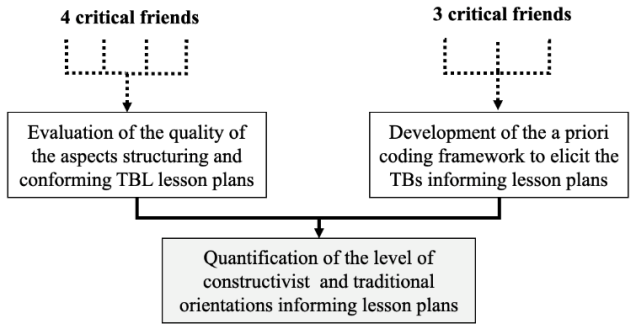


Figure 9: counting on critical friends in the evaluation of lesson plans

I first tried to check the reliability of my analysis of the quality of TBL lesson plans, but this proved to be particularly difficult for two main reasons: a) participants' lesson plans were in Spanish, but I was (and still am!) the only Spanish TBL Trainer-Consultant in the world

(http://www.teambasedlearning.org/talk-to-the-experts/); and b) TBL is a university methodology, and I was (and to my knowledge I still am!) the only person in the world training teachers in TBL at secondary schooling. In this situation, my position, while challenging in terms of reliability, proved to be advantageous again: it gave me access to 4 teachers who, after participating as 'innovators' in the previous stage of the institutional educational change initiative, were preparing themselves to become TBL mentors within the school federation. Funnily enough, they were developing their ability to give critical and constructive feedback on TBL units by practising the evaluation of the quality of 3 TBL lesson plans created by some of the 55 participants in the CPD programme addressed by this research (one lesson plan per term during year 1). All 4 prospective mentors voluntarily agreed to become critical friends, and I compared my evaluation with that conducted by them in 12 lesson plans. Appendix 6 shows the consistency between my interpretation and that conducted by the 4 critical friends.

I then tried to maximise the reliability of the coding framework that would help me elicit the levels of constructivist and traditional orientation underpinning the first termly drafts of participants' lesson plans by turning to 3 critical friends. The community of TBL specialists, while growing, is still not very numerous. However, I managed to count on the critical advice from 3 senior academics and TBL Consultants: the creator of TBL himself, the President of the Steering Committee of the global TBL community (http://www.teambasedlearning.org/), and the President of the European section of this community. After a process of mutual feedback (Appendix 7), and consistently with the theoretical framework informing this research, I developed a framework with 12 aspects identifiable in TBL lesson plans and structured in 2 compatible, complementary 6-item lists concerning the constructivist and traditional orientations (Table 3). This framework enabled me to quantify the level at which both belief orientations were informing participants' lesson plans by adding the number of aspects met in every list: very high (6), high (5), medium (4), low (3), and very low (≤2). To ensure consistency, I coded the 6 aspects of every belief orientation in every initial draft of lesson plans according to the framework and then quantified this coding in 2 different phases: a) progressively as far as participants

were sharing their plans throughout their participation; and b) intently focused for 2 days just after concluding the collection of the lesson plans after year 2.

Table 3: framework used to elicit the level of constructivist and traditional orientations informing lesson plans

	Aspects of lesson plans concerning the constructivist orientation	**Aspects of lesson plans concerning the traditional orientation**
1	Student learning outcomes are well defined in terms of skills or competencies	The teacher has identified the relevant theoretical content to be covered by the plan
2	Classroom activities are aligned with student learning outcomes, fostering the development of the skills defined in them	Student learning outcomes address all the theoretical content identified for the plan
3	Classroom activities make the content significant for students by linking it to their context and experiences	The test for individual pre-class study addresses all the content included in the learning outcomes
4	Classroom activities are designed to foster peer learning through collaboration	All the content referred to in the learning outcomes is addressed in classroom activities
5	Classroom activities are challenging and promote deeper understanding through students´ experience when applying content	Classroom activities are aimed at fostering the understanding of theoretical content
6	Resources for individual pre-class study are selected, adapted, edited, or created to limit the fundamental content for individual study	Individual pre-class study requires too much time from students (or the amount of time has not been taken into consideration by the teacher)

Once I had uncovered the levels of the 2 belief orientations in the initial draft of all 244 lesson plans as reliably and consistently as possible, I tried to infer how they evolved in every participant. In contrast to the self-appraisal of their own TBs, which took place only 3 times, participants' action across 6 termly lesson plans constituted a process, a kind of melody made up of notes or lesson plans, a sort of 'continuous flow of activity' (Corbin & Strauss, 2015, p. 173) whereby participants tried to adapt the initial drafts of their plans both to my feedback in previous plans and to their classroom experience as far as the CPD programme was moving forward. This process, in turn, could be 'progressive' and 'developmental' towards the intended increasement of the constructivist approach, or could 'stall for a while and go forward or backward' (p. 173) without linear progression. To capture its nature and quantify the evolution of enacted TBs consistently with the other perspectives, I developed the four-level coding framework presented in Table 4.

Table 4: coding framework for the analysis of the evolution of TBs informing lesson plans

Categories	Properties: constructivist orientation		Dimension: engagement		Quantification
	Level	Stability	Number of lesson plans	Availability	
	Very high (6) High (5) Medium (4) Low (3) Very low (≤2)	Always The last 5 cases In most cases Half of cases	5-6 4-6 1-3 None	At work Off work (sick or on maternity leave)	
Adaptive change	Very high or high	Always The last 5 cases	5-6	At work	2
Slightly adaptive change	Very high or high	In most cases	3	Off work	1
			4-6	At work	
No change	Medium, low or very low	Half of cases	4-6	At work	0
	Any level		1-3		
Maladaptive change	Low or very low	Always	1-6	At work	-1
			None		

Almost certainly, the levels in constructivist and traditional orientations of the first lesson plan submitted by many of the participants were partly the result of my in-person feedback during the face-to-face training. Nevertheless, the melody composed did allow me to discern the type of change in enacted TBs occurred during the two-year CPD programme, if any: adaptive change, slightly adaptive change, no change, or maladaptive change. For example, and without trying to be exhaustive, the evolution shown by participants who submitted 5-6 lesson plans throughout the 6 terms consistently showing a high or very high level of constructivist orientation points to adaptive change in enacted TBs (Figure 10a). The progress of participants submitting 4-6 plans and showing a high or very high level of constructivist orientation in most cases, but not in all of them, suggests that the adaptive change is not yet consolidated, and thus it is only slightly adaptive (Figure 10b). The evolution of participants who submitted 1-3 lesson plans only or 5-6 lesson plans showing medium, low, or very low constructivist orientation in half of them suggest the inexistence of actual change (Figure 10c). Finally, the action of participants who, remaining at work, refused to submit lesson plans for whatever reason or whose lesson plans systematically showed low or very low constructivist orientation suggests maladaptive change (Figure 10d).

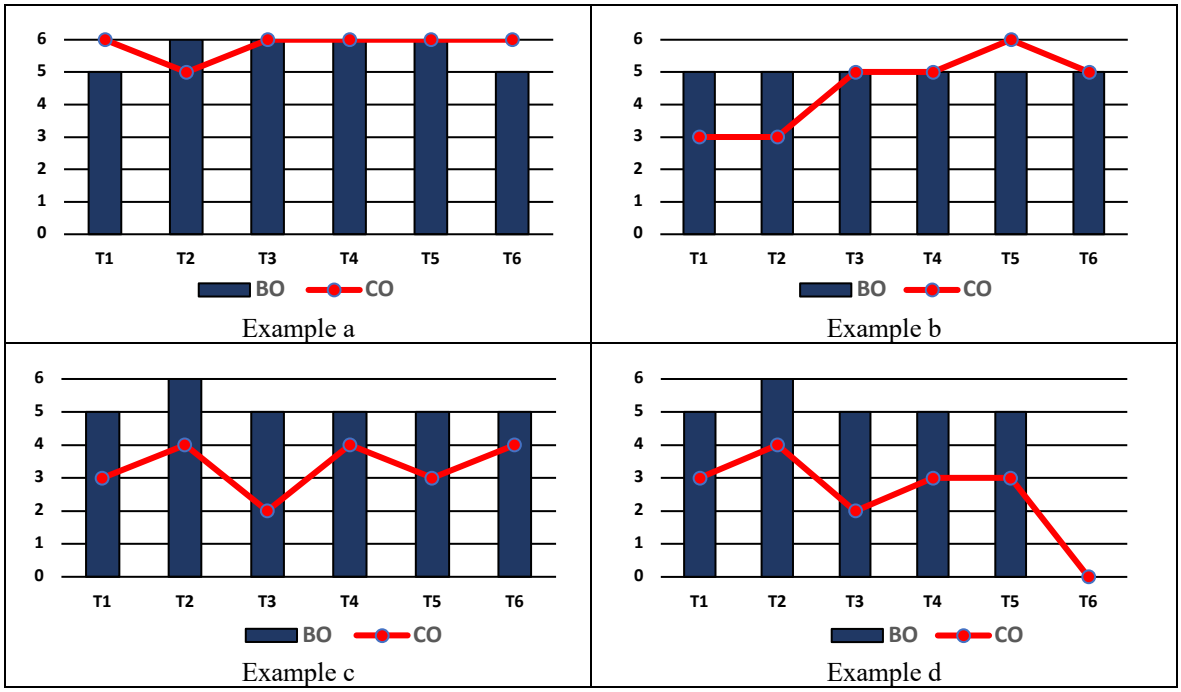


Figure 10: examples of the melodies composed by the evolution of constructivist orientation

As the qualitative analyses of both lesson plans and teachers' reflections was highly interpretive, I decided to ensure their independence from the quantitative one by coding lesson plans and teachers' reflections before processing the data collected through the questionnaire. In this analysis, I interpreted the scarcity of participants' comments within the online community and the insufficient number of lesson plans submitted as a sign of participants' progressive disconnection from the CPD programme and thus as the absence, or irrelevance, of change in their TBs. To help me track participants individually, I developed a tailor-made Microsoft Excel tool collecting lessons plans, narrative accounts, the process of coding and quantification (the conversion of the hierarchical order of the codes capturing the degree of change to an ordinal scale that uses numbers) in all 3 perspectives on TBs, as well as the pieces of evidence supporting my decisions (Appendix 8).

3.2.3.1.1.3 Implied TBs: teachers' reflections and comments

The reflections and comments of teachers throughout 2 academic years allowed me to elicit the evolution of their stance on the constructivist classroom teaching practices piloted when implementing the TBL lesson plans in the classroom. I developed the coding framework shown in Table 5 with the same 4 categories as in enacted and implied TBs: adaptive change, slightly adaptive

change, no change, and maladaptive change. In Subsection 5.6.2.3 of Article 2, I detail the reasons why the evolution of teachers' stance can be uncovered by focusing on 5 properties with different dimensions and explain how I tried to maximise consistency throughout the analysis of all 55 narrative accounts.

Table 5: a priori coding framework for the evolution of implied TBs

<table>
<tr><th rowspan="6">CATEGORIES</th><th>PROPERTIES</th><th>DIMENSIONS</th><th rowspan="6">Quantification of categories</th></tr>
<tr><td>Engagement in reflections</td><td>Termly, some, no reflections</td></tr>
<tr><td>Newness of TBL</td><td>Innovative, familiar, usual</td></tr>
<tr><td>Emotions</td><td>Very positive, positive, mixed, negative, none</td></tr>
<tr><td>Pros/cons</td><td>More advantages, balance, more disadvantages</td></tr>
<tr><td>Prospect</td><td>Adopting, extending, maintaining, reducing, avoiding</td></tr>
<tr><td>Adaptive change</td><td colspan="2">- Termly reflections, some reflections
- Innovative or familiar
- Very positive emotions
- More advantages
- Adopting, extending</td><td>2</td></tr>
<tr><td rowspan="2">Slightly adaptive change</td><td colspan="2">- Termly reflections, some reflections
- Innovative or familiar
- Very positive or positive emotions
- More advantages
- Maintaining or not mentioned</td><td rowspan="2">1</td></tr>
<tr><td colspan="2">- Termly reflections, some reflections
- Usual
- Very positive emotions
- More advantages
- Adopting, extending, maintaining or not mentioned</td></tr>
<tr><td>No change</td><td colspan="2">- Termly reflections, some reflections
- Innovative or familiar
- Mixed or no emotions
- Balance
- Maintaining or not mentioned</td><td>0</td></tr>
<tr><td rowspan="2">Maladaptive change</td><td colspan="2">- Some reflections
- Innovative or familiar
- Negative emotions
- More disadvantages
- Reducing or avoiding</td><td rowspan="2">-1</td></tr>
<tr><td colspan="2">- No reflections</td></tr>
</table>

3.2.3.1.2 Phase 2: cluster analysis

The process of coding and subsequent quantification (the conversion of the hierarchical order of the codes capturing the degree of change to an ordinal scale that uses numbers) of Phase 1 provided me with a holistic view of every participant in the form of 3 variables, one per perspective on TBs (Appendix 9). In Phase 2, I turned to cluster analysis to explore the possible existence of profiles

using IBM SPSS Statistics (Version 29.0). In contrast to ‘traditional’, variable-centred approaches to analysing change such as correlations or linear regression models, person-centred approaches focusing on profiles such as cluster analysis, ‘also called multivariate similarity’ (Tondeur et al., 2008, p. 2547; after Gore, 2000), while ‘untraditional’ (Ekehammar & Akrami, 2003, p. 451), have gained increasing attention (e.g., Li et al., 2020) and could inform future, ‘more targeted interventions’ (Aresi et al., 2021, p. 221). Cluster analysis helped me capture the heterogeneity of participants by grouping them in distinct, homogenous profiles according to how the 3 perspectives on the evolution of their TBs combined following regular patterns.

The number of clusters identified depends on the subjective decision of the researcher and should be explicitly justified, as ‘cluster analysis is… an interpretative quantitative procedure’ (Tondeur et al., 2008, p. 2547). All clustering methods have advantages and disadvantages. The most popular of them are hierarchical and partitioning clustering, the advantages of the former being the drawbacks of the latter and the other way round. In this sense, one of the advantages of hierarchical clustering is the generation of a dendrogram which can be used to graphically identify the optimum number of clusters without specifying it in advance. In contrast, the K-means algorithm, which is the most popular partitioning technique, succeeds in avoiding overlapping clusters (Omran et al., 2007). Article 2 will explain and justify more in detail my analytic strategy. I firstly used Ward´s agglomerative hierarchical method to identify the most appropriate number of clusters, and the dendrogram obtained pointed to the existence of 3 homogeneous groups of teachers (Figure 11). Then, I ran the K-means algorithm to define them and to check how far this three-cluster solution was stable, strong, and robust. Finally, I used Boferroni’s test to check how far the differences in all 3 perspectives between all 3 profiles were significant (Figure 12).

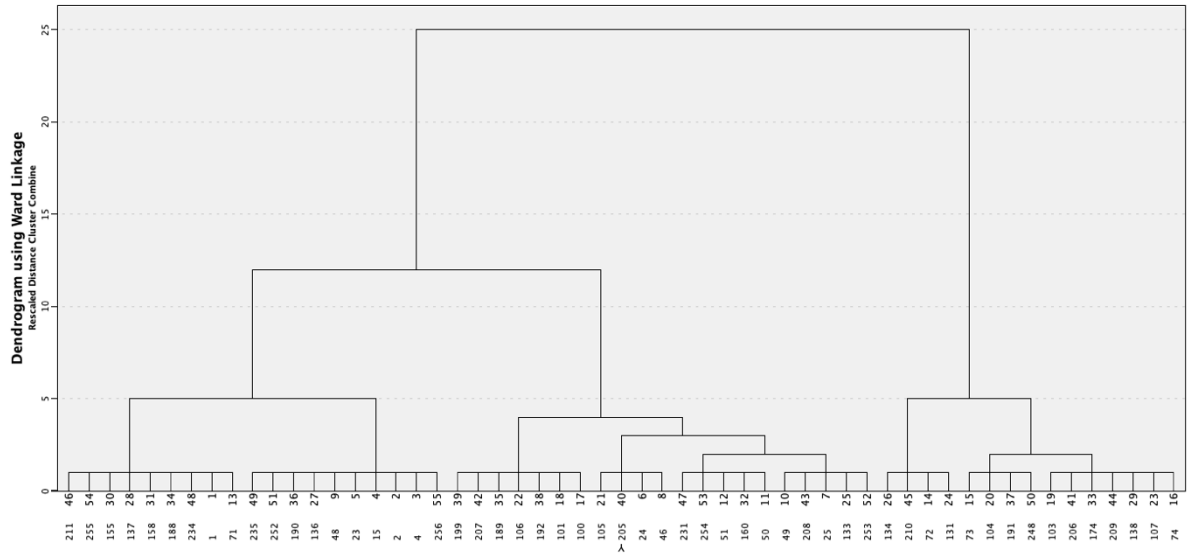


Figure 11: dendrogram yielded by hierarchical clustering using Ward's method

Multiple Comparisons

Bonferroni

Dependent Variable	(I) Cluster Number of Case	(J) Cluster Number of Case	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Sel-reported TTBs	1	2	-.336	.271	.664	-1.01	.34
		3	-1.622*	.262	<.001	-2.27	-.97
	2	1	.336	.271	.664	-.34	1.01
		3	-1.286*	.234	<.001	-1.86	-.71
	3	1	1.622*	.262	<.001	.97	2.27
		2	1.286*	.234	<.001	.71	1.86
Implied TTBs	1	2	-2.243*	.282	<.001	-2.94	-1.54
		3	-1.726*	.272	<.001	-2.40	-1.05
	2	1	2.243*	.282	<.001	1.54	2.94
		3	.517	.243	.115	-.08	1.12
	3	1	1.726*	.272	<.001	1.05	2.40
		2	-.517	.243	.115	-1.12	.08
Enacted TTBs	1	2	-1.632*	.239	<.001	-2.22	-1.04
		3	-.261	.230	.786	-.83	.31
	2	1	1.632*	.239	<.001	1.04	2.22
		3	1.371*	.206	<.001	.86	1.88
	3	1	.261	.230	.786	-.31	.83
		2	-1.371*	.206	<.001	-1.88	-.86

*. The mean difference is significant at the 0.05 level.

Figure 12: results of Bonferroni's Post Hoc test

3.2.3.2 Research questions 3 and 4: thematic analysis, matrices, and IMTPG

Reviewers within the field of teachers' beliefs have listed the most relevant factors influencing change in TBs, particularly in response to teacher education (Fives & Buehl, 2012; Gill & Hardin, 2015; Levin, 2015; Girardet, 2018; Fives et al., 2019). However, the interaction between them appears to be complex, and an appropriate understanding of how participants' background influenced the evolution of their TBs in response to the CPD programme would require an 'ecological' approach accounting for this complexity (Ashton, 2015; Buehl & Beck, 2015; Fives & Buehl, 2012). To do so, my analysis

included 4 phases (Figure 13). In Phase 1, I used the NVivo 14 software package and developed a thematic framework using an adaptation of Spencer, Ritchie, O´Connor et al. (2014) approach to thematic analysis to identify all the possible influential factors. In Phase 2, I used the resulting framework and general matrices to explore the nature of the factors identified according to 3 dimensions: their character (facilitators or obstacles), their relevance, and their domain of professional growth. In Phase 3, I applied an adaptation of the IMTPG in the light of the three-dimensional nature of factors to understand the complexity of their dynamics by identifying possible change sequences and growth networks. Finally, in Phase 4, I used the general matrix to explore the possible association of every factor with different subgroups of teachers.

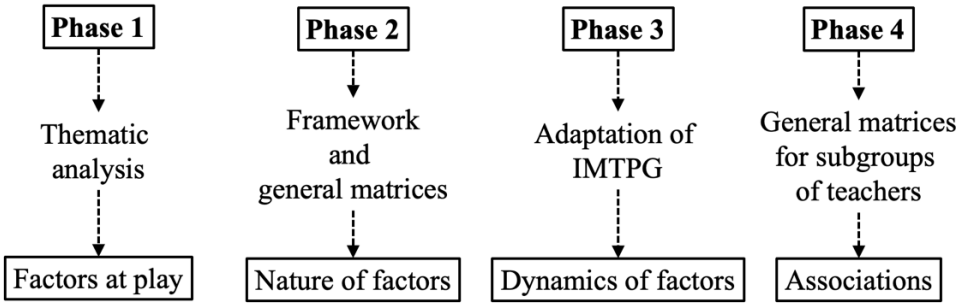


Figure 13: the phases of the analysis answering research questions 3 and 4

3.2.3.2.1 Phase 1: thematic framework to identify the influential factors

To minimise the 'risk of losing temporality, context, and sequence' (Cohen et al., 2018, p.673) during the analysis, I considered the conversation threads maintained between every teacher and me as the mentor throughout the 2 years of the CPD programme as unitary narrative accounts. These narrative accounts covered 8 pages on average, followed the chronological order, and included the date and time of every comment. I decided to use the NVivo software package because of 'its key benefits in terms of assisting the analytical process' (Spencer, Ritchie, Ormston, et al., 2014, p. 287), creating 55 cases. I also created a case classification, defining the values of 6 attributes in every case (the above-mentioned demographic variables): gender, discipline, teaching experience, school, educational setting (baccalaureate or vocational education), and the profile of evolution of TBs found when answering research questions 1 and 2. Then, I created a dynamic set for every value of all 6 attributes

to facilitate ulterior crosstabulation. In subsection 5.6.2.1 of Article 3, I explain how I tried to remain as exploratory as possible, detail the 3 stages of the process of abstraction followed in the design of the thematic framework (Figure 14), and explain how I managed to remain rooted in, and faithful to, the data collected. In the process of abstraction, I refined the hierarchical structure of the thematic framework and enriched the codes in 4 ways: a) rearranging the hierarchical structure of elements, aspects, categories, and subthemes in simpler, more meaningful ways; b) merging subthemes that included few passages; c) dividing subthemes which were too densely populated; d) creating new subthemes; and e) identifying new codes and coding non-indexed passages for the new subthemes.

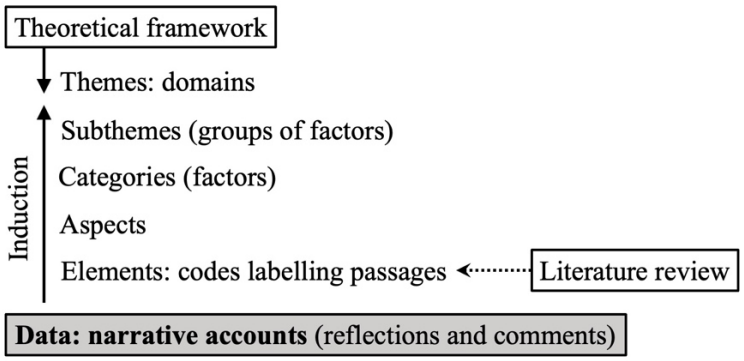


Figure 14: development of the thematic framework

To increase the reliability of my analysis, I tried to ensure 'retroductability' (Elliot, 2018, p. 2860; after Wodak, 2014) and to account for the analytical process 'in a systematic and transparent way' (Spencer, Ritchie, Ormston et al., 2014, p. 278) by 'careful recording' (Richards, 2021, p. 185) how codes, themes, and subthemes progressively emerged. Subsection 6.5.2.1 will explain in detail the 4 steps taken in this process to ensure the traceability of the analysis.

I provide additional information in the form of appendices, which are just a sample of the information thoroughly recorded in the research journal. Appendix 10 presents an example of the coding stripes of cases as narrative units. Appendix 11 shows the evolution of the thematic framework, firstly after year 1 and then and after year 2, once I decided to use the four domains of the IMTPG as the themes structuring all the factors of the framework. Appendix 12 shows the density of codes in the final thematic framework.

3.2.3.2.2 Phase 2: matrices to explore the nature of factors

Grouping the factors identified according to their domain of professional growth (theme), I used matrices to uncover how far (relevance) they facilitated and/or inhibited (character) the intended change in TBs. These matrices were in Microsoft Excel format for its versatility: they allowed me to both use colours to visualise the findings and include the reflections coded in the form of notes to make them available by hovering the mouse over the corresponding cell. In terms of character, I used framework matrices crossing every factor with every participant. In the corresponding cells, I included all the reflections coded (Appendix 13), reproducing 'the actual words used' rather than just summaries to retain their actual meaning (Spencer, Ritchie, O'Connor et al., 2014, p. 310), and I interpreted whether they had a positive, negative, or neutral tone by considering not only their reasoning but also the possible emotions implied by words at the aspect level.

It is true that research into sentiment lexicons and their validity is needed, but I used the NCR Emotion Lexicon (Mohammad & Turney, 2010, 2013) to elicit the possible emotions implied by reflections for 3 reasons. Firstly, it is the largest publicly available lexicon listing words according to both Plutchik's (1980) taxonomy of emotions (emotion lexicon) and the polarity of positive/negative emotions (sentiment lexicon). Secondly, this list proved to be highly accurate according to the `Naive Bayes´ classification algorithm (Pradhan et al., 2023). Finally, as Dip & Silenzi (2024) highlight in their study on Spanish students' written expressions, it has been accurately translated into Spanish (Mohammad & Turney, 2024) and is stable across languages.

Afterwards, I built a general matrix to cross participants (rows) with factors (columns), which in turn were grouped according to domains of professional growth, encompassing 2 columns (facilitator/obstacle). Participants' reflections were included as notes for them to be accesible by hovering the mouse over the corresponding cells, which were coloured in black, grey, or white to have an initial, visual insight for further analysis. For example, in participants 12 and 22 the cell corresponding the factor 'mentoring' as a facilitator was black, as the reflections coded in it were recurrent in the former and/or emphatic in the latter (using capital letters, exclamation points, or sentiment words). In contrast, the cell corresponding the factor 'teachers' previous familiarity with the

new teaching practice' as an obstacle was grey in participant 22 and white in participant 12, as it included one single reflection in the former and none in the latter.

The resulting general matrix (Appendix 14) allowed to uncover 3 dimensions in every factor: domain, character, and relevance. This enabled me to situate factors within 2 'discrete positions along a continuum' (Spencer, Ritchie, Ormston et al., 2014, p. 278), and thus to determine whether each factor acted as a facilitator (only facilitator or mainly facilitator), as a mixed factor (more facilitator than obstacle, equally facilitator and obstacle, or more obstacle than facilitator), or as an obstacle (mainly obstacle or only obstacle). Subsection 6.5.2.2 in Article 3 details how this general matrix also enabled me to evaluate the relevance of the influence of each factor by focusing on 3 attributes: prevalence, insistence, and emphasis.

3.2.3.2.3 Phase 3: the IMTPG to *uncover the underlying dynamics between factors*

Using the graphical representation of an adaptation of the IMTPG, I first distributed the factors identified according to domains, and then I figured out how enaction, reflection, and re-evaluation as change mediators could have occurred in the school intervention. Figure 15 uses different types of arrows to illustrate these dynamics between factors, numbering the different actions of change mediators and highlighting the cases where changes in TBs took place by using circles around the numbers. Subsection 6.5.2.3 in Article 3 details the meaning of every numbered arrow.

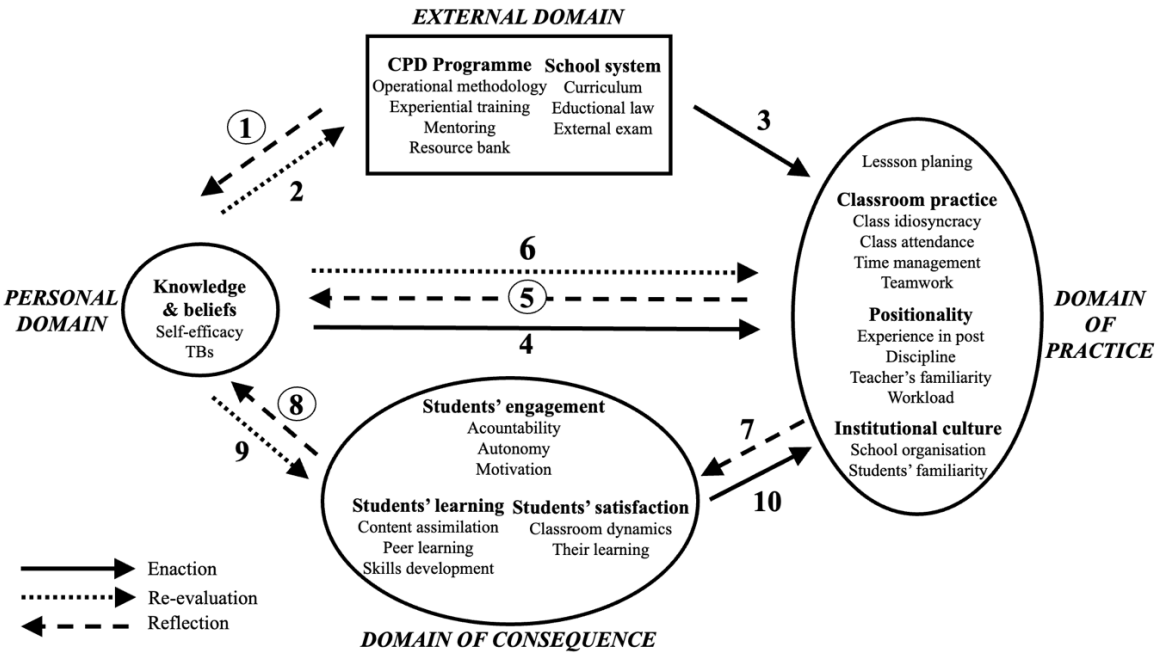


Figure 15: dynamics between factors adapting Clarke & Hollingsworth´s (2002, p.957) framework

3.2.3.2.4 Phase 4: matrices to explore association of factors with demographic variables

In Phase 4, I tried to uncover the possible association of factors with groups of teachers according to participants' gender, years of teaching experience, discipline, and educational setting (Baccalaureate or Vocational education) by creating as many copies of the general matrix as variables and then dividing the copied matrices according to the corresponding variable. For example, Appendix 15 shows the general matrix divided into 3 parts according to the years of teaching experience of every participant. Then, I analysed how differently the matrix displayed across these parts and, using quantities and percentages, I tried to find patterns that could suggest a degree of association between factors and variables, if at all.

3.2.4 Ethical considerations

The school federation's Steering Committee officially considered that this research was in the interest of the institution and did not require additional ethical review other than that granted by the university. In this sense, this thesis adhered to the British Educational Research Association Ethical Guidelines for Educational Research (BERA, 2018) and obtained ethical clearance from the Central University

Research Ethics Committee (CUREC) of the University of Oxford before collecting data (Appendices 16-20).

Although the school intervention was blended and included initial in person training, all the data were collected in digital format, and all the research took place remotely. In the questionnaire, potential participants were approached and sent an information sheet through an email to their institutional account, which had been facilitated by the Federation's Steering Committee previously. This mail had a link to the questionnaire hosted in the Microsoft Forms application of my Oxford University Office 365 account. In the questionnaire, I obtained participants' informed consent and collected the data at the same time. The questionnaire, which included 2 sections, was completed anonymously. The first section repeated the content of the information sheet and had only one question asking participants for their informed consent. Participants who agreed to participate, continued to the second section with the 17 questions. Participants who did not agree, if any, were not able to access the questionnaire. This process was followed in all 3 data collection timepoints: baseline, during the intervention, and after the intervention. Concerning lesson plans and reflections, I only accepted informed consent once participants left the two-day face-to-face training to avoid undue influence. The day after the in-person training, I sent an email with a link to a form in Microsoft Forms (using the Oxford University account) for teachers to complete their name and agree to participate if they were willing to do so. I attached to this email the information sheet projected and explained at the end of the face-to-face training, and I included this information in the header of the form. Apart from the questionnaire, the data were naturally collected as integral part of the programme with no interviews. They were not sensitive and very unlikely to cause any harm. In the information sheets, participants were also informed about the opportunity to withdraw from the study at any time before the end of data analysis through an email or a personal message within the institutional, digital platform where lesson plans and reflections were shared. Appendices 21 and 22 include the information sheets shared with potential participants in the quantitative and in the qualitative strand. They were included as appendices in the CUREC application and show how participants were explicitly and repeatedly

informed that the purpose of the study was the exploration of the evolution of their beliefs about teaching across 2 years.

Concerning data storage, contact details, the identity of all the teachers who have submitted their informed consent, and the informed consents were securely stored in the Nexus 365 account provided by the University of Oxford. For the questionnaire, informed consents were recorded in the Microsoft Forms file as a 'Yes' to the question in the first section. For lesson plans and reflections, they were recorded in the Microsoft Forms file including their data with the answer 'Yes' to the question about their agreement to participate. Both files were exported to Excel and separately stored in a folder called 'Informed consents' in the OneDrive application of the Nexus 365 of the Oxford University account. In this application, I also stored the results of the questionnaire in 3 formats: Microsoft forms, Microsoft Excel, and SPSS files. Similarly, while teachers' reflections and lesson plans were an integral part of the institutional professional development programme taking place within the online community hosted in the institutional Microsoft Teams, their analysis was also stored in the university's One Drive application. This analysis included files in several formats such as Word, Excel, OneNote, and NVivo 12. I stored my field notes in the form of a research journal using the OneNote application included in the university's Nexus 365 account. All the data will be retained for as long as they are of continuing value to the me as a researcher and to the wider research community.

As the raw data concerning teachers' reflections and lesson plans came from the mutual interaction between me and participants within the online community hosted in my institution's Microsoft Teams, they were accessible to all the participants, to me as the teacher educator, and to the Head of the Pedagogic Area of my institution. However, the informed consents, the raw data concerning the questionnaire and the analysis of teachers' reflections and performance were only accessible to me and to my supervisors. I will remove the file including the name and the code of participants and also the files including their informed consents from the Nexus 365 account once the research project has finished, which will erase the participants' personal data that was being stored for the project. As the CUREC approval states, all the research data (including consent forms, tasks results, the analysis of teachers' reflections and lesson plans, and field notes) will keep de-identified and safely stored for as

long as they are of continuing value to the research community and then removed. My supervisors will be responsible for ensuring that the data are securely deleted if I have no longer access to the university's Nexus 365 account. The raw data stored in the institutional Microsoft Teams will keep existing as the initial step of a thriving community of practice which is intended to be permanent.

To minimise potential risks to confidentiality, participants in the online questionnaire were coded and de-identified at the baseline timepoint, using a unique number across all analyses. In the case of lesson plans and reflections, which were taken from the community of practice, teachers' identity at the point of these data being shared in this community were identifiable (as this is the normal practice in this setting). However, that a teacher was taking part in the study was not made known among the online community. During the analysis, these participants were also coded and de-identified using a unique number across all analytical stages. The coded and de-identified data were stored separately from, and not linkable back to, participants' identifiable information. In their reflections, participants did not name particular pupils, and thus anonymisation of students was not necessary.

Special care was taken with the participation of 4 critical friends to test the reliability of my analysis of the quality of the lesson plans designed by participants when exploring their enacted TBs. While they did not participate in the CPD programme by creating lesson plans, they were being institutionally trained as mentors in the same school intervention and thus considered as participants evaluating some lesson plans. For their recruitment, I used my University of Oxford account to send an email with an information sheet attached, asking them to become "critical friends" by giving me their informed consent through an online form. In this form, they were given the opportunity to opt out of their participation at any time before the end of the data analysis phase through a personal email. Once these 4 "critical friends" agreed to participate, I posted a message on the digital platform where participants were sharing their lesson plans and reflections to inform them about the process of these teachers becoming "critical friends". In this message, I ensured participants that the evaluation by them would be completely confidential, and the authorship of the lesson plans evaluated would be completely anonymised for them. These evaluations and my analysis of them were stored in the above-mentioned University's Nexus 365 account. I gave participants the opportunity to opt out

confidentially if they did not want their lesson plans to be analysed by these “critical friends” through a link to a confidential, online opt-out form on the same digital platform.

The research involved some additional issues which might be relevant in ethical terms. There was small burden upon participants in the form of the time taken to complete the questionnaire, which was very short and easy to fill in to ensure that this burden was as small as possible. As lesson plans and reflections as well as the evaluation of some lesson plans by “critical friends” were naturally created as integral part of the professional development programme, no additional burden was placed on participants. Moreover, the thesis raises some issues of positionality, as I was a researcher exploring my own practice in my own institution. Firstly, some participants might have felt obliged to take part due to my senior role in the institution. In order to reduce this felt obligation, in every information sheet I placed special emphasis on how participation in the project was voluntary. Secondly, I might have possible interests in the results of the study as a means to support my pedagogical convictions, my institutional role, or my professional development. I was not able to avoid these conflicts, but I made the most to minimise and mitigate them through ongoing reflection and discussion with my supervisors, making the results as trustworthy as possible, as Article 1 will show in the next section.

4. Article 1: Maximising methodological rigour within challenging positions: philosophical engagement and digital journaling

4.1 Abstract

Teacher educators are encouraged to become practitioner researchers and produce valuable knowledge. However, studies aimed at understanding how we manage to meet the standards of rigour within our particular contexts are needed. In this paper, I examine the methodological insights gleaned from a piece of practitioner research in teacher education within a particularly challenging position and its two possible contributions for educational research. Firstly, I show how my engagement with philosophical considerations allowed me to pioneer the adoption of a middle-ground ontology enabling to underpin mixed methods in an innovative way. Then, I examine how my use of a digital, mixed research journal to maximise trustworthiness and validate my findings could be informative and helpful for other researchers. I conclude with some recommendations for future research. Particularly, I discuss the implications of my ontological approach for the incommensurability issue and remark that its potential for underpinning the use of mixed methods without necessarily drawing on either pragmatism or critical realism might well deserve further exploration. I also discuss the pertinence of, and the necessity for, further research on how researchers within challenging positions can use and harness journaling as a tool for validating their findings.

Key words: Ontology · Practitioner research · Mixed methods · Research journal · Journaling · Trustworthiness

4.2. Introduction

In this paper, I examine the methodological insights gleaned from a piece of practitioner research in teacher education that explores the evolution of teachers' teaching beliefs in response to continuous professional development. Practitioner research is an umbrella term that lacks unanimous definition and blurs both terminologically and conceptually. Terminologically, it has been used as a synonym of multiple expressions, each one of them with their own 'special connotations', such as practice-based research or practice through research, (Heikkinen et al., 2016, p. 3). Conceptually, it has been

identified with just one approach such as action research (e.g., Oolbekkink-Marchand et al., 2014) but has also been used to refer to a broader research tradition which, in turn, has been structured in different and, to a certain extent, divergent taxonomies of approaches. For example, according to Borko's et al., (2007) typology of genres of empirical research in teacher education, the piece of practitioner research addressed in this study would fit well into interpretive research rather than into practitioner research because, unlike self-studies, it focuses on the influence of my practice on student teachers rather than on their practice itself. According to Cochran-Smith & Donnell (2012, p. 507), in contrast, it would be a genuine piece of practitioner research in using 'practice as a site for research'.

The notion of practitioner research is also blurred in terms of purpose. There are scholars who highlight that it has often been fostered to promote professional development by usually turning to some form of collaboration between the practitioner researcher and academics working outside the site of research (Banegas y Consoli, 2023). Others emphasise that it has traditionally been conducted for the main purpose of improving and informing practice within particular contexts (Foreman-Peck & Heilbronn, 2018), giving rise to sets of criteria aimed at making this transformative purpose operational (e.g., Westbroek et al., 2022). Yet, some authors contend that, when excellent, practitioner research produces valuable knowledge that can be relevant and informative beyond those particular contexts (Finch, 2022). It is true that this claim is disputed, as it has been underestimated by policy makers and by the large research community (e.g., Cochran-Smith, 2005) for facing major validity and reliability issues derived from the practitioner researcher's insider position (Foreman-Peck & Winch, 2010). However, these authors remark that practitioners are 'surrounded by rich research opportunities' (Stenhouse, 2013, p. 299) and may be in an advantageous position for logistical and even epistemological reasons (Berger, 2015; Kacen & Chaitin, 2006; Padgett, 2008). They contend that, when excellent, practitioner research can 'contribute to reliable public knowledge about both method and theory' (BERA, 2018, p. 3) and, as in the case of usefulness, have developed varied frameworks to operationalise methodological quality and maximise rigour from different traditions and approaches (Bullough & Pinnegar, 2001.; Cochran-Smith & Donnell, 2012; Dana & Yendol-Hoppey, 2020; Eisenhart & Howe, 1992; Finch, 2021, 2022; Hammersley, 2008; Heikkinen et al.,

2007, 2012, 2016; Herr & Anderson, 2015; Levin, 2012; Oancea & Furlong, 2007; Zeichner & Noffke, 2001).

In this vein, scholars within the field of teacher education highlight the 'need for teacher educators to be at the forefront of research' (Mayer et al., 2017), pointing to the particular suitability of 'practice-oriented studies that engage practitioners in the production of research' (Mayer & Oancea, 2021). Yet, studies seeking to understand how teacher educators engage in research and strive to make the most of the above-mentioned frameworks for methodological quality in order to provide our research with rigour within our particular contexts are scarce and could contribute valuable methodological insights. Following Cochran-Smith & Donnell (2012), in this paper I understand practitioner research as a form of inquiry whereby practitioners become researchers by using our own practice as a site for research and explore my endeavour for quality and rigour in two pieces of practitioner researcher aiming to contribute valuable empirical knowledge to the field of teacher education (possible self-reference to articles 2 & 3). I contend that, in trying to meet the requirements of excellent practitioner research within a uniquely advantageous yet particularly challenging position, I make some methodological and theoretical contributions that might be relevant for other practitioners and social researchers. I argue that my thorough engagement with philosophical considerations provides an ontology underpinning the use of mixed methods in an innovative way. I also contend that the form in which I harnessed my digital, mixed research journal to maximise trustworthiness and validate my findings can be informative and helpful for other researchers.

In the following sections, I first set out my position as a practitioner researcher. Then, I examine how this position helped me build my use of mixed methods on the works of Xavier Zubiri (1980, 1982, 1983, 1999). Afterwards, I analyse how I managed to maximise the credibility, transferability, dependability, and confirmability of my findings. Finally, I discuss the possible value of my methodological contributions for future research.

4.3 My practitioner researcher position

I am an experienced K-12 philosophy teacher at a school under the umbrella of a state-sponsored federation encompassing 21 state-sponsored schools across Spain with over 1,500 teachers in total. I

became the headteacher of the school for more than 10 years and then went on to join the Steering Committee of the federation with the responsibility for, among other things, leading the development of the federation's educational project as well as designing and leading its institutional dissemination across the Baccalaureate and vocational education.

As a teacher educator, I designed a multi-stage, research-based intervention that could fit well within Borko's et al., (2007) 'design research' genre of empirical research in teacher education. As part of my master's dissertation, in the first two stages of this project I found evidence of the power of a disruptive methodology called Team-Based Learning (TBL) to drive educational change in my own K-12 philosophy classes. I also found evidence of the promising nature of a bespoke, blended continuous professional development (CPD) programme as a possible driver for educational change. In the third stage, I engaged in doctoral studies and produced the longitudinal piece of practitioner research addressed by this paper: a two-year, multi-school case study aimed at understanding how far this CPD programme would succeed in driving educational change. The programme included two-day, in-person training of 55 teachers on TBL, as well as subsequent personalised, timely mentoring in the design and implementation of 6 TBL units during 2 academic years within an online community.

Assuming belief change as a prerequisite for sustained change in teaching practices, I decided to explore the evolution of teachers' beliefs about teaching in response to the programme. Yet, to gain a holistic, comprehensive understanding of their evolution, the elusive nature of beliefs required me to elicit them indirectly from as many perspectives as possible, and thus to mix methods, which has been said to be relevant and pertinent to practitioner research (Finch, 2022) and particularly needed for research into belief development (Levin, 2015). This led me to reflect on how my philosophical worldview could help me to underpin the use of mixed methods.

While the impact of the researchers' philosophical assumptions on their research is inevitable (Hitchcock & Hughes, 1995), making them explicit is often overlooked or `hidden from view´ (Creswell & Poth, 2018, p. 21). However, showing the consistency between ontology, epistemology, and methodology is paramount to ensure rigour and robustness within the fields of teacher education

(Hamilton et al., 2020) and practitioner research (Oancea & Furlong, 2007; Heikkinen et al., 2016). In this sense, my position as a philosophy teacher allowed me to be fully aware of the importance of the ontological basis of my research. It also led me to be very familiar with different philosophical traditions and to be previously committed to a particular worldview which was rooted in the Zubirian philosophy and helped me to address the issue of paradigm incommensurability when underpinning my use of mixed methods.

4.4 Underpinning the use of mixed methods

4.4.1 The issue of paradigm incommensurability

It has been said that the existence of different, incommensurable research paradigms is 'an immense open, philosophical question' (Cohen et al., 2018, p.36). While some authors contend the existence of more than three (e.g., Creswell & Plano Clark, 2017), the most widely accepted approach distinguishes two main paradigms referred to with different terminologies: post-positivism assuming an objective ontology that supports the use of quantitative methods, and postmodernism or constructivism assuming a subjective ontology that demands the use of qualitative methods. Given their incompatible ontological assumptions, the existence of 'irreconcilable differences' across quantitative and qualitative methodologies has been highlighted as an insurmountable obstacle for mixed methods research (Beach & Kaas, 2020, p. 214), thus emphasising the centrality of the problem of incommensurability (e.g., Hammersley, 2013).

Pragmatism and critical realism, in turn, are the philosophical worldviews most commonly used to avoid the implications of the issue of paradigm incommensurability in order to underpin mixed methods research (Cohen et al., 2018). Some scholars contend that pragmatism represents a third paradigm allowing for the use of mixed methods (Foster, 2024; Johnson & Onwuegbuzie, 2004; Kaushik & Walsh, 2019). However, while commonly assumed by academics who challenge the issue of paradigm incommensurability (Tashakkori et al., 2020), pragmatism has been said to be an epistemological approach without a clear ontological stance, requiring from researchers the conceptualisation of possible ontologies to underpin the use of mixed methods (Maarouf, 2019). In this line, some scholars contend that the suitability of pragmatism as a genuine paradigm that

overcomes the problem of incommensurability and supports the rigour of mixing quantitative and qualitative methods remains questionable (e.g., Hampson & McKinley, 2023).

Other scholars turn to critical realism to support mixed methods (Maxwell & Mittapalli, 2010; Mukumbang, 2023; Zachariadis et al., 2013). Drawing on Bhaskar (1975, 1978, 1989), critical realism has been said to be a philosophical school of thought providing 'a framework for those who have decided to follow the "realist turn" away from positivism and constructivism' (Gorski, 2013, p. 659). However, it might be argued that critical realism is actually naïve and still remains within the post-positivist perspective: it contends that 'social reality is independent of any *particular* human mind' (Gorski, 2013, p. 666, emphasis in original), but assuming that reality consists of entities transcending human experience and existing beyond the act of intellection is highly problematic in ontological terms and ultimately might well represent a form of positivism.

It is not my purpose to address the debate about the suitability of philosophical pragmatism and critical realism as alternative approaches to post-positivism and constructivism. Rather, I argue that, in making the most of my position as a philosophy teacher, I assumed an innovative ontology that allows the research to be driven by the research question(s) and to mix methods without necessarily drawing on any of them. The implications of adopting Zubiri's ontology were paramount, as it allowed me to question the very notion of research paradigms and to contend the suitability of mixing methods in an innovative way. This adoption increased the methodological robustness of my piece of practitioner research without turning to, and avoiding the limitations of, philosophical pragmatism and critical realism.

4.4.2 Zubiri´s philosophical approach

As one of Husserl's and Heidegger's pupil, Zubiri followed the phenomenological maxim of returning 'to the things themselves' (Husserl, 2001) by examining phenomena just as they are experienced, remaining within human facticity and focusing on the realm of pure immanence (Gracia, 2017), on 'what is given by the senses' (Zubiri, 1999, p. 33). However, as he was very knowledgeable about the state of the art in science during the 20th century (Corominas & Vicens, 2024), he tried to relaunch

philosophy in postmodernity in a very distinctive manner which builds on a 'noology' or comprehensive theory of human intelligence. For him, human intellection unfolds in three structural 'modes' or 'phases': a) 'primordial apprehension' of reality or things apprehended as ontological 'otherness' or 'alterity'; b) 'logos' or explanation of what these things apprehended 'in reality' are with respect to other things; and c) 'reason' or 'methodological explanation of what things are and why they are' (Fowler, 1999, p. 12), which can adopt different forms, but notably science[1].

4.2.2.1 Ontology: reality as alterity in primordial apprehension

Zubiri's phenomenological approach focusing on pure immanence and on human facticity led him to assume that, in contrast to philosophical positivism and naïve realism, the aspiration to transcend our experience and go beyond what is given in apprehension is metaphysically unwarranted. We cannot bridge the gap between us and a supposed zone of things in themselves; things are not in themselves but just in our apprehension. This does not mean, however, falling into solipsism; nor does it mean renouncing to metaphysics and necessarily embracing Heidegger's post-metaphysic ontology. Zubiri contends that the assumed opposition between sensory experience (*aesthesis*) and intellection (*nous*) pervading throughout the whole history of philosophy is unjustified: sensory experience is already a form of intellection and intelligence is constitutively sentient. Strictly speaking, knowing and reality are congener or, as it has been translated into English, '[they] stem from the same root; neither has priority over the other' (p.3). Zubiri highlights that what is immediately given in the very act of our primordial apprehension is 'in its own right' (p. 23) or 'of its own' (p. 26), that 'in this real affection something "other" is present to us; this is the otherness' (p. 25). The form in which we sense the things immediately given in the apprehension is 'alterity' (p. 26), they impose themselves on us as otherness. And this character of alterity that we can realise without transcending primordial apprehension has not been created by us and is independent of us: in the apprehension itself, 'otherness' has 'a force of imposition' (p. 26). This form of alterity given to, and imposed on, us within the most elemental apprehension is reality. Accordingly, reality remains within our

[1] For a more detailed explanation of Zubiri´s philosophy, the reader can turn to the translator´s introduction in the English version (Fowler, 1999).

apprehension and is ‘formality’ (p. 4): the sentient, physical form in which we apprehend the things imposed on us as other than us ‘of its own’. The ‘meta’ of metaphysics does not point to something beyond the apprehension but to something ‘other’ than the physical act of apprehension.

The ‘physical presence of the real’ (p. 26) in our apprehension is ‘a prius’ (p. 83), implying that reality is alterity in its own right before having a name (language) and a meaning (utility). Thus, while temporarily simultaneous, reality is structurally prior to being, just as primordial apprehension is structurally prior to logos and reason, which are the subsequent levels of human intellection. Human intellection is not only understanding through logos. Rather, in structural terms, it is primarily sentient apprehension of reality, and ‘man is thus the animal of realities’ (p. 104). What is given in our apprehension is not a simple stimulus that triggers a reaction like in animals: it is reality, physical otherness, something which is other than us ‘of itself’ within the apprehension (p. 26). Hence, rather than being ‘there’ as Heidegger’s (1962) Da-sein, we are ‘possessed by reality’ (p. 273) and live primarily in and with things ‘in their own right’. Thus, things are not in isolation but open to other things, and they are always apprehended ‘respective to other things’ and forming ‘fields’, which determine what they are “in reality”’ (p.93). This respective intellection of what things are ‘in reality’ is a mode of knowledge that is beyond ‘primordial apprehension’, a form of ‘logos’ or of ‘reason’.

4.2.2.2 Interpretivist epistemology and mixed methods

The ontological analysis of primordial apprehension outlined above led Zubiri to adopt a form of a ‘subtle realism’, which is a worldview contending that reality cannot be reduced to ‘socially constructed meanings’ but ‘is only known through [them]’ (Ormston et al., 2014). This leads to an interpretivist epistemological approach where the researcher, as an insider ‘anchored in reality’ (Zubiri, 1999, p. 149) rather than as an outsider separated from it, inevitably shapes the research (Dean et al., 2018; Letherby et al., 2014) from a particular position and can only aspire to provide a particular interpretation from a situated viewpoint. From his perspective, ‘the real imposes on us’ (Zubiri, 1999, p. 278) in the form of ‘alterity’, and things are directly sensed as ‘otherness’ in our primordial apprehension. Yet, any other intellectual effort beyond this primordial apprehension, be it in the form of ‘logos’ or of‘reason’, is not ‘direct’ but ‘mediated’, positioned, and thus interpretive.

This is why Zubiri emphasises the inherently limited character of knowledge beyond primordial apprehension: nothing is direct but the form in which we sense things as ‘otherness’. Any knowledge of things beyond this character of ‘alterity’ is always a construct mediated by multiple pre-existent structures and can only be a situated interpretation from a particular position. In the intellectual phase of logos, which apprehends what things are with respect to other things, this positionality is conformed metaphysically by the respective nature of the real, which is sensed ‘fild-ly’ (Zubiri, 1999, p. 121) or as within fields. Arguably, if this position were just metaphysical, one could consider adopting Sen’s (1993) `positional objectivity´. Yet this position is also shaped epistemologically by inherited prejudices, interests, and intellectual ‘horizons’ that mediate and condition any kind of human understanding, thus making the intellective phases of logos and reason interpretive by nature.

Accordingly, researchers can only adopt an interpretivist rather than objectivist epistemological approach. While things impose in the form of ‘otherness’, thus becoming reality, researchers can only aspire to provide a rigorous, honest interpretation from a particular position or horizon, rather than an unbiased description of a ‘view from nowhere’ (Nagel, 1986). The impact of positionality is unavoidable, and the task of the researcher is to make it explicit for public scrutiny. As a practitioner researcher, my endeavour to understand the influence of continuous professional development on teachers’ practices by focusing on the evolution of the teaching beliefs orienting them was a form of ‘reason’ in Zubirian terms. As any intellectual effort to explain things beyond primordial apprehension, it was inevitably interpretive by nature, not just because beliefs are a psychological construct aimed at understanding teaching practices that cannot be directly apprehended but indirectly inferred.

Zubiri’s ontology shows that, rather than disparate realms, knowing and reality are counterparts within the same act of intellection, the two sides of the same coin. There is no act of intellection without reality (alterity or otherness), and there is no reality without a human act of intellection. From this perspective, the postpositivist and postmodern paradigms seem unwarranted: assuming that reality is beyond our apprehension is philosophically untenable, and so is ignoring that reality is alterity within our intellection and cannot be reduced to social or cultural constructions. This ontological primacy of

the real as ‘alterity’ has been overlooked by hermeneutics in contending that human intellection is always mediated (Gadamer, 1975) and ignored by the postmodern ‘relativist turn in epistemology’ which assumes that all forms of knowledge are mediated by contextual prejudices (Susen, 2015). Zubiri’s notion of reality provides an original, still unexplored basis to overcome the dichotomy between objective and subjective ontologies that informs the debate about research paradigms. It led me to align with scholars contending that the issue of paradigm incommensurability seems to be a false problem (e.g. Pring, 2015), and thus to contend that mixing methods is not necessarily problematic for the researcher.

4.6. Validating the findings by increasing trustworthiness

I have emphasised the importance of making the researcher’s position explicit within the interpretive epistemology derived from Zubiri’s ontology. My use of this ontology is precisely a piece of evidence of how my position as a history of philosophy teacher was an advantage for me to be aware of the importance of ‘paradigm-dependant considerations’ (Oancea & Furlong, 2007, p. 128) for the rigour of my practitioner research. In terms of rigour, however, I was also aware that my position was fraught with particularly difficult challenges. Yet, these challenges were not posed by my insider perspective because, according to Zubiri’s ontology, the researcher is always within the thing being researched, and the claim for an outsider view is ontologically unwarranted. Rather, the challenges did lie in my possible interests in the findings of my research: I was a teacher educator researching my own practice within my own organisation with a great interest in the findings concerning an intervention designed, promoted, implemented, and led by myself. Even unintentionally, the findings might well be shaped by an unconscious interest in using the research to support and justify my pedagogical convictions, in urging other organisations adopt the CPD programme, or in enhancing my professional reputation and improving my institutional position. This led me to do everything possible to validate my findings by maximising the trustworthiness of my research, which is a measure of quality and rigour widely used within the field of teacher education (Heikkinen et al., 2016; Vanassche & Kelchtermans, 2015) but less attended than others in practitioner research (Finch, 2021).

Given my interpretivist epistemology, I turned to Lincoln & Guba's (1986) framework for trustworthiness in naturalistic enquiry as well as to some of the strategies maximising trustworthiness that are available in the literature (Anney, 2015; Onwuegbuzie & Leech, 2007). The criteria for rigour in naturalistic research proposed by Lincoln & Guba (1986) substitute the positivist notions of internal validity, external validity, reliability, and objectivity for those of credibility, transferability, dependability, and confirmability, respectively. Credibility concerns the 'truth value' or the degree to which the findings provided by the researcher are trustworthy and deserve the confidence of the reader. Transferability refers to the extent to which the findings can be transferred to, or applied in, other contexts and settings. Dependability evaluates how far the findings provided are consistent and stable over time or across several researchers. Finally, confirmability deals with the strength of the influence of the values of the researcher in the findings, evaluating how far this influence can be minimised. In this section, I argue that the form in which I tried to validate my findings by maximising trustworthiness might be exemplary and thus relevant for practitioner research. Firstly, I show how I capitalised on my challenging position, using it as a uniquely rich and privileged opportunity to increase knowledge as well as a great asset for the credibility of the findings. Then, I analyse how I developed and kept a digital research journal to maximise not only their confirmability, but also their transferability and dependability.

4.6.1 Maximising credibility by harnessing positionality

My position as the teacher educator of the institutional CPD programme, as a senior TBL Trainer-Consultant, and as a practising K-12 teacher using TBL systematically within the same institution put me in a unique position to maximise the credibility of the findings for several reasons. Firstly, it allowed me to share participants' context and institutional values, as well as to know first-hand their pedagogical culture. What is more, as a TBL practitioner, I had already completed the same emotional and pedagogical journey expected to occur in participants as a result of the CPD programme, which provided me with a privileged perspective to understand their difficulties, lived experiences, and actual variations in teaching beliefs. Secondly, it enabled me to interact with participants individually from a longitudinal approach, extending the ongoing collection of data throughout the two-year of

mentoring process. This personal, 'prolonged engagement' (Lincoln & Guba, 1986, p. 77) with participants, alongside my leadership by example in the adoption of TBL for K-12 students, maximised the development of mutual trust and thus the quality of the data collected. It is true that in the field of teachers' beliefs the 'veracity' of the data gathered can be questionable because they are usually collected as 'coursework' fundamentally 'intended to assign grades' (Gilles & Fives, 2015, p. 7). However, this was not the case, as the products of the CPD programme were purely practice-oriented and participants were accountable before their principals rather than before me, as I was only responsible to provide support and advice. Thirdly, this 'persistent observation' (Lincoln & Guba, 1986, p. 77) most probably allowed me to build rapport and gain participants' necessary confidence to share their concerns, challenges, emotions, and actual beliefs, putting me in a unique position to understand in depth their lived experiences and to elicit the evolution of their teaching beliefs as a result of the CPD programme. Fourthly, my position enabled me to infer teachers' teaching beliefs from three different perspectives (reported, implied, and enacted beliefs) by using different methods of data collection, which is one the features of quality practitioner research. This provided the research with a more holistic understanding of their evolution over time and thus likely with 'an adequate representation of the phenomenon under study' (Onwuegbuzie & Leech, 2007, p. 240; after Newman & Benz, 1998). Fifthly, being the only teacher educator in the intervention ensured the same support to every participant and thus consistency in the data collected, which is one of the greatest challenges in research on instructional coaching and is only addressed by a few studies (Bruns et al., 2018; Kotze et al., 2019; Kraft & Hill, 2020). Finally, as a TBL Trainer-Consultant, I was able to count on the creator of TBL and on senior members of the TBL community as critical friends when developing the coding framework aimed at eliciting the teaching beliefs enacted by teachers in their lesson plans. Critical friendship is a particular form of collaboration used within the field of teacher education to increase the credibility of their findings (e.g., Bullock, 2020).

4.6.2 Journaling as a tool for transferability, dependability, and confirmability

Apart from making the most of my position to increase credibility, I tried to maximise trustworthiness and 'legitimate[d] and validate[d] research procedures' (Mortari, 2015) through transparency and

reflexivity, which is a ‘crucial strategy in the process of generating knowledge’ when the role of the researcher is prominent (Berger, 2015). To do this, I turned to journaling, which has been proposed as a strategy to foster reflexivity in qualitative research at large (Lamb, 2013; Lichtman, 2023; Lincoln & Guba, 1985; Ortlipp, 2008) and in doctoral studies in particular (Corlett & Mavin, 2018; Meyer & Willis, 2019; Orange, 2016). From among the different types of reflexivity that researchers can perform through journaling (Oliphant & Bennett, 2020), I followed Longhofer & Floersch’s (2012) typology, focusing particularly on the ontological, epistemological, and methodological modes of reflexivity, as evidenced by the philosophical considerations outlined above. However, journaling has also been recommended to increase confirmability, as documenting some steps of the research process makes the researcher’s decision making available for public examination, thus representing ‘the construction of an audit trail’ or ‘confirmability audit’ (Wolf, 2003, p. 175; after Lincoln & Guba, 1985). I argue that the form of journaling used by me contributed to increasing not only confirmability but also transferability and dependability, thus maximising trustworthiness.

4.6.2.1 Digital, mixed journaling

In his review of literature on journaling, McGrath (2021) recommends keeping two types of reflecting writing simultaneously: a) a research journal for entries recording ‘the processes, thoughts and perceptions of a researcher that can be used as a form of evidence to support the final research product’ (p. 246); and b) a memoing journal ‘for deeper analytic thinking and ideas’ concerning ‘the positioning of the researcher within a study’ (p. 259). However, he also recognises that the distinction between these two types of entries is difficult for novice researchers as well as that sometimes the difference between the two types of entries blurs. As a doctoral student, I felt uneasy with this approach and opted for a single, mixed journal recording every single step, decision, and progress made across the whole research process throughout 3 years. To make this possible, I explored the different options that technology enabled and decided to keep a purely digital, mixed reflexive journal using Microsoft OneNote, due to its versatility and intuitiveness. Indeed, this digital application runs synchronously in computers and tablets, allowing innumerable types of entries: thoughts and reflections typed in the computer and handwritten using the tablet; attachments of all the different

types of file formats used during the research (pictures, PDF, Word, Ppt, Excel, NVivo, SPSS, etc.); screenshots of mails or slides, as well as printouts of word and pdf documents to be reviewed and analysed by handwriting on them; drawings, figures, and mind maps. This versatility enabled me to record what had been done, how, when, and why, thus documenting every single step of the whole research process virtually on a daily basis: the emergence of the research design, the evolution of the data collection, the progressive data analysis, the ongoing review of the literature, the creation of successive drafts of reports and articles, and the reflections and decisions informing, and derived from, this process. Moreover, its flexibility allowed me to structure the journal in such a way that it would be very easy for me to navigate and consult the entries, as it would be for anyone interested in understanding, transferring, examining, and challenging my research (click on this link to view the Mixed Research Journal).

As a doctoral student, I organised the journal entries chronologically in academic years, months, days, and different entries per day by using bracketed numbers (Figure 16). The digital application used for journaling was set up to validate the records by creating incremental backups every fortnight, and I made them on a weekly basis depending on the intensity of the work, so that the emergence and traceability of ideas, thoughts, decisions, analysis, and reports could be easily checked. To maximise accessibility, I strove to record all the entries and files attached in English, although he and all 55 participants were Spanish. I sensed that this form of digital journaling would provide me with an audit trail sufficiently powerful to maximise trustworthiness and validate my research as much as possible.

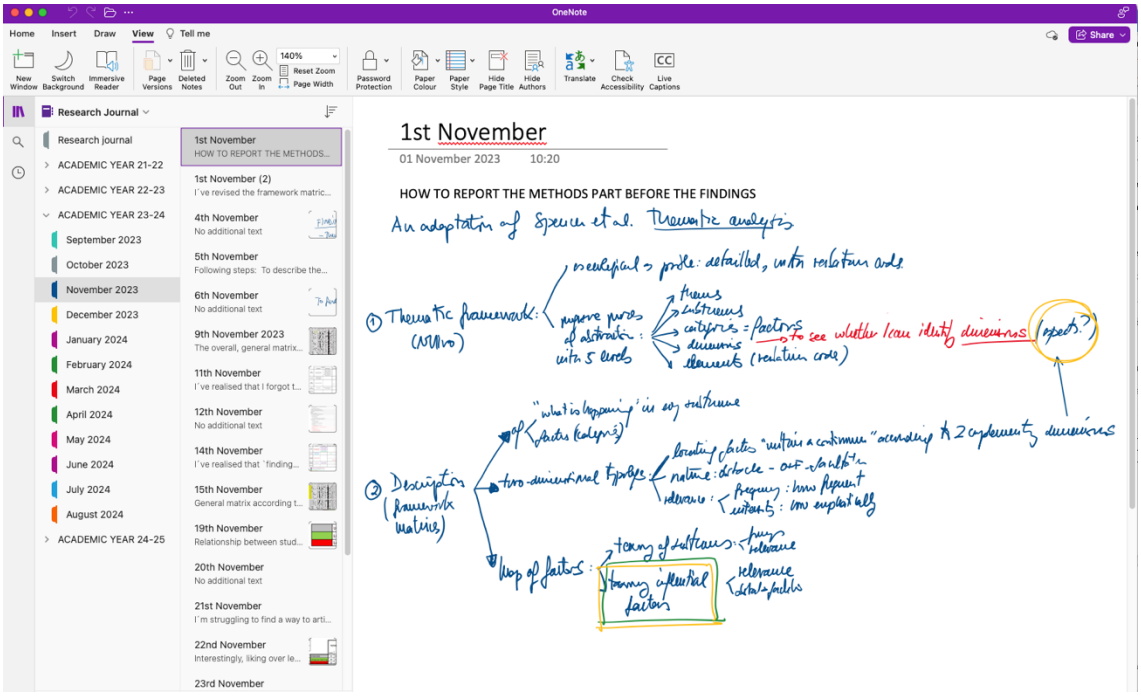


Figure 16: screenshot of the first entry on a day during the 3rd academic year

Literature on how journaling is used in qualitative research at large is scarce (McGrath, 2021; Montgomery & Bailey, 2007; Ortlipp, 2008) and thus studies addressing how to use digital journaling to increase trustworthiness in mixed-methods practitioner research in particular seem very pertinent. The following subsections address this gap, exploring how I used my digital journaling strategy to maximise transferability, dependability, and confirmability of his research.

4.6.2.2 Journaling and transferability

My role as a senior member at the school federation gave me direct access to an unusually great number of potential participants from a wide variety of schools across 8 different regions of Spain for an unlimited period. This allowed me to use purposeful rather than probability sampling in the selection of an unusually big sample of participants, who were strategically recruited within a wider piece of design research in teacher education so that they were particularly suitable to answer the research questions, which 'facilitates transferability of the inquiry' (Anney, 2015, p. 278; after Bernard, 2000; Bitsch, 2005; Schutt, 2006; Teddie & Yu, 2007). Yet, scholars agree that transferability or the feature allowing the application of the research in other contexts can also be achieved through 'thick', 'detailed' accounts and elucidations of the research process that facilitate other researchers to

make comparisons and consider how far the research is applicable to their own contexts (Lincoln & Guba, 1985; also Bitsch, 2005; Li, 2004; Anney, 2015; Onwuegbuzie & Leech, 2007). I argue that my digital, mixed journal represents a powerful tool for the transferability of my piece of practitioner research. To illustrate this conclusion, I focus on the entries concerning the data collection, particularly on the administration of the baseline, validated questionnaire aimed at eliciting one of the three perspectives on teaching beliefs included in the synergetic approach: how teachers report their own teaching beliefs. These entries allow other researchers to know how my context influenced the administration of the questionnaire and to compare this context with their own in order to evaluate how far the research is transferable to their situation. They also allow them to know the decisions made and the procedure followed by me within my context and thus to evaluate its usefulness by analysing how far it can fit their own contexts.

In the entries covering three months, I recorded the following stages: a) the adaptation of the questionnaire to the culture and language of my and participants' organisation, specifying who participated in this adaptation, why, when, how, as well as the adaptations made and the rationales for them; b) the evolution of the different versions of the questionnaire in online forms and how the final one ended up including participants' informed consent; c) the procedure followed to enable individual tracking of participants throughout the 3 measurements (baseline, after year 1, and after year 2); d) the strategy aimed at counting on a sort of control group made up of as many teachers as possible who were not participants in the CPD programme; e) the procedure followed to send the questionnaire to potential participants, to control their participation virtually on a daily basis, and to identify those who had not participated yet (Figure 17); f) the steps followed to maximise participation, thanking those who had participated in order to foster their participation after years 1 and 2, as well as addressing again those who had not participated yet after one week and, if necessary, after two weeks; and g) the decisions made concerning how and where the data collected should be storage before their analysis. To record this process, I used screenshots of mails, links to the different versions of the questionnaire, texts typed about my reflections on individual tracking and ethical issues, handwritten text to design

strategies, attached Excel files controlling participation, attached Word documents with versions of the texts of the emails encouraging participation, etc.

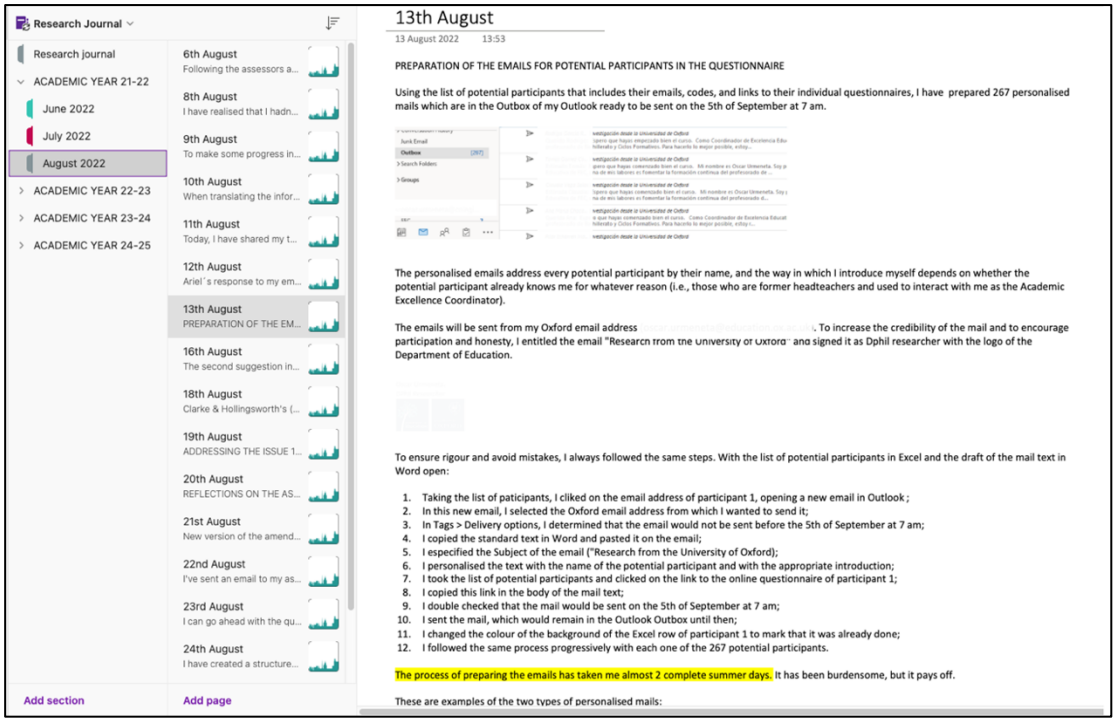


Figure 17: screenshot of a journal entry on the preparation of emails for potential participants

One could say that 'it is by no means clear how "thick" a thick description needs to be' (Lincoln & Guba, 1985, p. 77). However, the contextualised description of the procedure followed by me to collect data through the baseline questionnaire was sufficiently informative to guide the data collection after years 1 and 2, allowing me to replicate the very same procedure by reviewing the journal entries. The degree of detail of the journal entries covering all the stages of the longitudinal research throughout 3 academic years (research design, data collection, data analysis, and report of findings) equals the one described above. In my view, this degree of thoroughness is sufficiently powerful to help other researchers compare contexts and evaluate the transferability of the research. Accordingly, in keeping my digital, mixed journal thoroughly, I was also making my research transferable.

4.6.2.3 Journaling and confirmability

Confirmability concerns the extent to which readers can certify that the practitioner researcher's interpretation is firmly rooted in the data rather than influenced by his possible interests. Researchers agree that it can be attained through tools such as audit trail and reflective research journals (Anney, 2015; Bowen, 2009; Lincoln & Guba, 1985). I contend that the digital and mixed nature of my journal allowed me to combine reflexivity and audit trails in the same place and in a very effective manner, maximising the quality of the audit trail and thus the traceability of my findings for 3 reasons. Firstly, it increased the exhaustiveness of the audit trail: the versatility of the tool enabled the inclusion of content in many formats, which facilitated me to record any single step of the research process with a great quantity and variety of information, including links to raw data when they were too heavy for the tool. Secondly, it increased transparency in allowing me to make the journal available for public scrutiny in a universal way, independently of time, place, and amount of people interested in examining it. Finally, it enabled me to ensure 'retroductability' (Elliott, 2018; after Wodak, 2014) through systematic and periodic backups of the journal: anybody can check the introduction of possible changes in past entries and thus verify that entries have not been modified by me after their creation in my own interest. In allowing to put everything together (reflections, decisions, analyses, data, attached documents, etc.), to optimise accessibility, and to ensure chronological order, the research journal became a tool for facilitating and maximising confirmability.

Table 6 provides an example of the power of the digital, mixed journal to increase confirmability. It shows how it can be established by creating an audit trail made up of countless of entries concerning the evolution of the teaching beliefs enacted by participants in the lesson plans designed as a result of their participation in the two-year CPD programme. This audit trail enables prospective researchers to fully understand the logical and chronological emergence of findings from the very beginning of the research process as well as to critically examine their traceability in order to check that they 'can be substantiated from the data collected' (Lincoln & Guba, 1982, p. 4) and were not shaped in my interest.

Table 6: audit trail establishing dependability of findings concerning enacted beliefs

Audit trail	Content of journal entries
Reflections for the identification of lesson plans as a source of data for teachers' enacted teaching beliefs	-Typed reflections - Handwritten reflections and mind maps - Word documents reporting progress attached - Printouts of word documents with typed and handwritten reflections
How, when, and why data (lesson plans) were collected and securely stored	- Screenshots of the location of raw data. - Links to raw data (lesson plans) - Typed reflections on the progress of data collection. - Word documents with reports attached. - Printouts of word documents with handwritten reflections
Development of the tool for the analysis of lesson plans	- Drawings made by hand and handwritten reflections - Excel files with the progress of the tool - Screenshots of the tool with handwritten comments - Word documents attached reporting the development of the tool - Printouts of the word documents with handwritten comments
Development of the coding framework to uncover the teaching beliefs enacted by teachers in their lesson plans	- Typed text developing the strategy to count on critical friends - Screenshots of mails from critical friends with handwritten reflections - Word documents attached reporting the progress - Printouts of Word documents with handwritten reflections. - Screenshots of the framework with handwritten comments
Progressive process of coding lesson plans	- Excel files attached with notes - Typed and handwritten reflections on issues found and rationales for decisions
Findings emerged from coding lesson plans	- Excel files attached - Typed comments
Progressive process of recoding lesson plans	- Excel files attached with notes - Typed and handwritten reflections on issues found and rationales for decisions
Findings emerged from recoding lesson plans	- Excel files attached - Typed comments
Analysis comparing the findings of coding and recoding, exhaustive recording of disagreements and final decisions with their rationales.	- Excel files attached - Typed reflections and decisions
Development of the synergetic approach integrating teachers' enacted teaching beliefs into a three-dimensional, holistic view.	- Word documents attached - Printout of Word documents with handwritten reflections - Drawings by hand and handwritten comments
Progressive integration of the findings concerning enacted teaching beliefs with the other two perspectives on teaching beliefs	- Excel files - Journal articles attached and print out with handwritten reflections - Word documents attached reporting the progress in the integration with typed and handwritten reflections and comments - Screenshots of tables with handwritten reflections
Progressive clustering analysis	- Journal articles attached and print out with handwritten reflections - SPSS files. - Screenshots of SPPS files with typed and handwritten reflections - Word documents attached reporting the progress in the analysis - Printouts of Word documents with handwritten reflections - Charts with handwritten comments
Successive drafts reporting the findings	- Word documents attached - Printouts of Word documents with handwritten reflections and amendments.

4.6.2.4 Journaling and dependability

Dependability concerns how far the findings of the research are stable, robust, and consistent over time (Bitsch, 2005). One of the 'legitimation technique(s)' (Onwuegbuzie & Leech, 2007, p. 247) for dependability within the constraints inherent to doctoral studies is coding and recoding the same data twice at different points in time in order to compare both analysis and evaluate the degree of their agreement (e.g., Saldaña, 2014). The audit trail used above to established confirmability includes an example of my use of coding and recoding as a technique to maximise confirmability in the analysis of the evolution of teaching beliefs enacted by participants in their lesson plans. However, audit trails can also be used to establish dependability of findings (Anney, 2015, p. 278; after Bowen, 2009; Li, 2004) in allowing to review how far the research process leading to them met the criteria of 'good professional practice' (Lincoln & Guba, 1982, p. 4).

The digital, mixed journal enabled me not just to record the coding and recoding processes, but also to demonstrate the independence between them through the incremental backups, as well as to create an exhaustive audit trail and including all the documents necessary for checking and crosschecking. In this sense, I argue that I succeeded in using journaling as a tool for maximising dependability, as it allowed me to record the process of coding and recoding as a piece of evidence of the robustness, stability, and internal consistency of the findings. Figure 18 presents the screenshot of one of the entries recording the coding-recoding process, which details the participants whose lesson plans were re-coded on that day, the number of lesson plans recoded in every participant, the amendments made (if any), and their rationales. Figure 19, in turn, shows a screenshot of the entry addressing the conclusion of the whole coding-recoding process, summarising the number of disagreements found, recording the changes made, evaluating their impact in the findings, and specifying the participants concerned by these changes for the reader to be able to crosscheck all the process, if necessary. These Figures suggest how the journal entries and the level of detail used in them support the robustness and dependability of his findings.

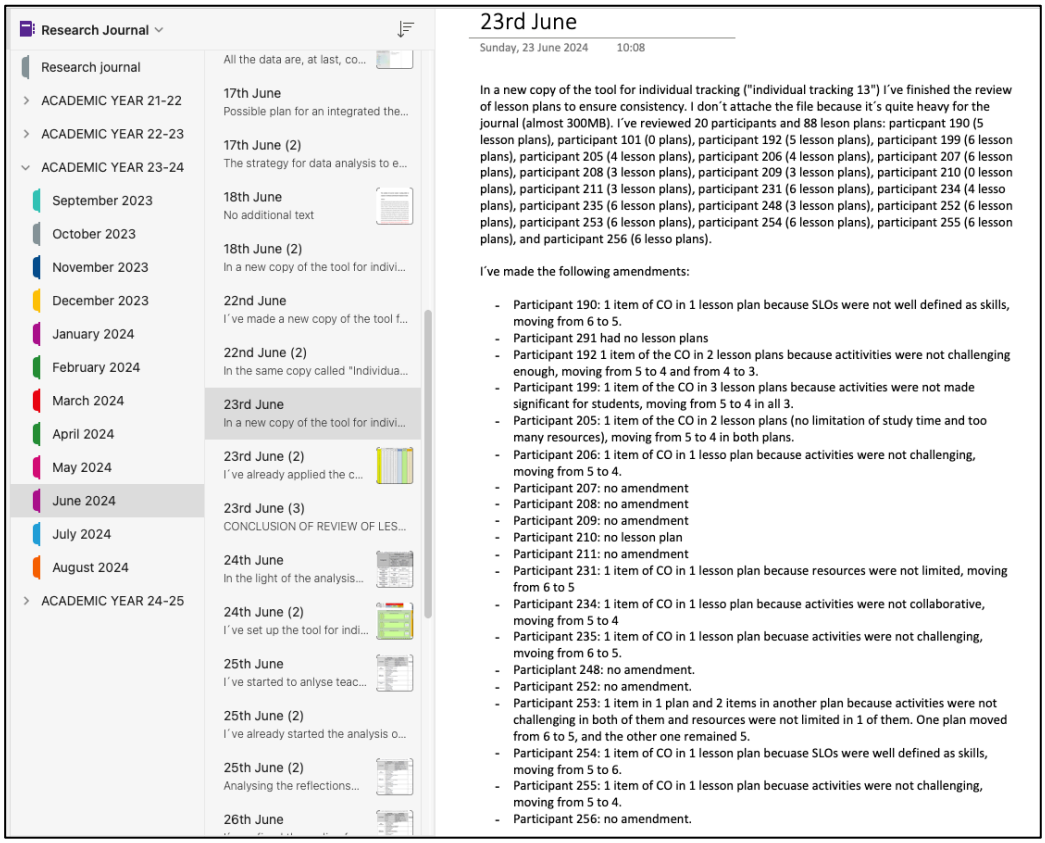


Figure 18: details of the decisions made during the coding-recoding process

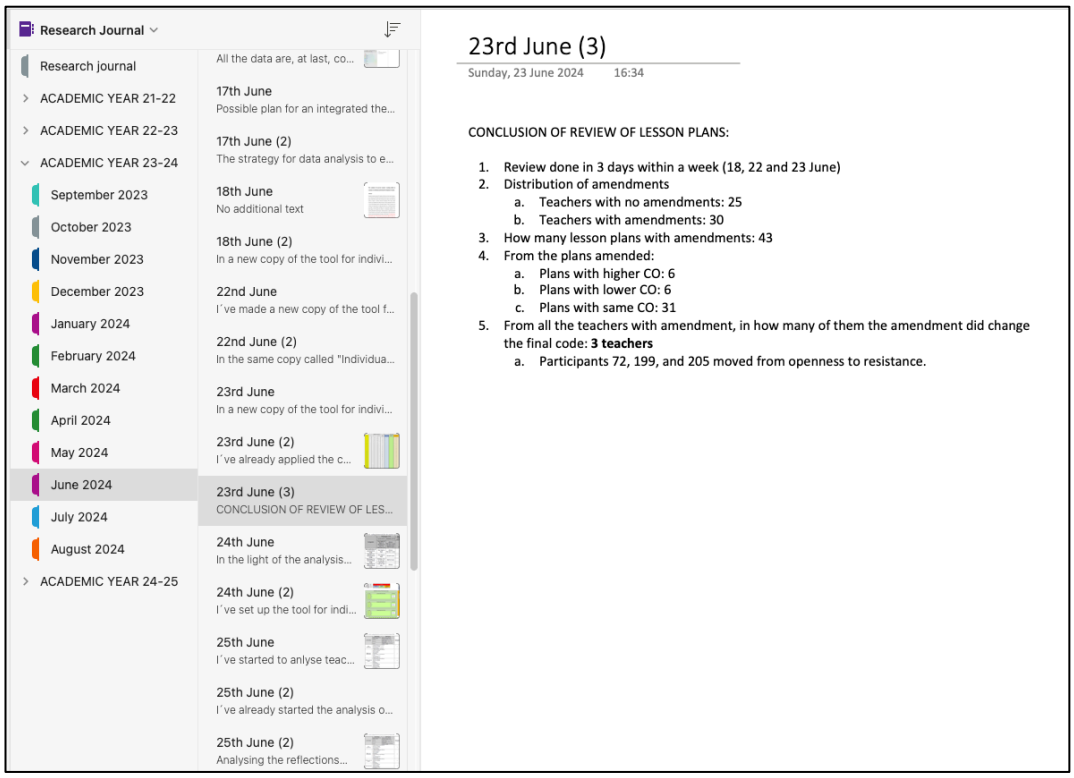


Figure 19: conclusions of the coding-recoding process to maximise consistency in findings

4.7. Discussion

This paper aimed to share the methodological insights gleaned from a piece of practitioner research conducted within a particularly challenging position. The form in which I strove to follow the frameworks for quality practitioner research for the purpose of contributing valuable knowledge to the field of teacher education could be 'informative, relevant or useful' (Vanassche & Kelchtermans, 2015, p. 518) for other practitioner researchers as a 'model of how practice works' (Lyons & LaBoskey, 2002, p. 6). It could also be of interest for social researchers at large as an original, still unexplored way to address the issue of paradigm incommensurability.

The analysis addressing both my reflections on the nature of my position in terms of validity and the manner in which I managed to harness its potential advantages to maximise the credibility of the findings can stimulate other practitioner researchers to reflect on the uniqueness and potential benefits of their own position. Moreover, it is true that literature on how researchers use journaling is scant (McGrath, 2021; Montgomery & Bailey, 2007; Ortlipp, 2008). However, my analysis of how I made the most of my research journal to maximise the trustworthiness of the findings by recording every single step of the research process to ensure traceability can be illuminating for other researchers. I my view, it can help them realise the potential of digital, mixed research journals as effective tools for increasing the transferability, confirmability, and dependability of their findings. This is why I consider my analysis particularly pertinent and encourage researchers to address this gap in research. Following Orange (2016), I also encourage supervisors to help doctoral students, particularly those conducting practitioner research, keep and structure digital journals that could help them improve the validation of their research.

Furthermore, in trying to provide my research with rigour through philosophical considerations, I contributed an innovative ontological approach which, apart from maximising the internal consistency of the design of my piece of practitioner research, might be of some relevance for other researchers interested in mixing methods. This approach represents a middle-ground, 'centrist' ontology that could provide theoretical coherence in the ongoing tension between the 'modernist [post-positivist] tendencies' and the postmodernist approach that 'questions universal truth… [and] is skeptical about

almost everything' (Craig & Curtis, 2020, p. 28). Zubiri's philosophy makes it possible to emphasise the limited, interpretive nature of any possible human understanding without necessarily falling into the ontological relativism that dilutes reality as a discursive, subjective, cultural construction. I argue that his analysis of 'primordial apprehension' entails that the 'paradigm trouble' (Hampson & McKinley, 2023) derives from an inaccurate analysis of knowledge and reality, which has two important implications that deserve further consideration: a) it provides scholars who contend that the issue of incommensurability is a false problem with an original, new ontological basis; and b) it opens up the possibility of underpinning the use of mixed methods in an innovative way, without necessarily drawing on either pragmatism or critical realism.

4.8 List of references

Anney, V. N. (2015). Ensuring the Quality of the Findings of Qualitative Research: Looking at Trustworthiness Criteria. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS)*, *5*(2), 272–281.

Bhaskar, R. 1975. A Realist Theory of Science, Leeds, UK: Leeds Books.

Bhaskar, R. 1978. The Possibility of Naturalism, Sussex, UK: Harvester Press.

Bhaskar, R. 1989. Reclaiming reality, London, UK: Verso.

Beach, D., & Kaas, J. G. (2020). The Great Divides: Incommensurability, the Impossibility of Mixed-Methodology, and What to Do about It. *International Studies Review*, *22*(2), 214–235. https://doi.org/10.1093/isr/viaa016

Berger, R. (2015). Now I see it, now I don't: researcher's position and reflexivity in qualitative research. *Qualitative Research*, *15*(2), 219–234. https://doi.org/10.1177/1468794112468475

Bernard, H. R. (Harvey Russell). (2000). *Social research methods: qualitative and quantitative approaches* (1st ed.). Los Angeles: SAGE Publications.

Bitsch, V. (2005). Qualitative Research: A Grounded Theory Example and Evaluation Criteria. *Journal of Agribusiness*, *23*(1), 75–91. https://doi.org/10.22004/ag.econ.59612

Borko, H., Liston, D., & Whitcomb, J. A. (2007). Genres of Empirical Research in Teacher Education [Article]. *Journal of Teacher Education*, *58*(1), 3–11. https://doi.org/10.1177/0022487106296220

Bowen, G. A. (2009). Supporting a grounded theory with an audit trail: an illustration. *International Journal of Social Research Methodology*, *12*(4), 305–316. https://doi.org/10.1080/13645570802156196

British Educational Research Association (BERA). (2018). Close-To-Practice Educational Research: A BERA Statement. Retrieved from https://www.bera.ac.uk/publication/bera-statement-on-close-to-practice-research [Accessed 3 October 2020]

Bruns, B., Costa, L., & Cunha, N. (2018). Through the looking glass: Can classroom observation and coaching improve teacher performance in Brazil? *Economics of Education Review*, *64*(March), 214–250. https://doi.org/10.1016/j.econedurev.2018.03.003

Bullock, S. M. (2020). Navigating the pressures of self-study methodology: Constraints, invitations, and future directions. In J. Kitchen, A. Berry, S. M. Bullock, A. R. Crowe, M. Taylor, H. Guðjónsdóttir, & L. Thomas (Eds.), *2nd International Handbook of Self-Study of Teaching and Teacher Education*. Springer, 245-267. https://doi.org/10.1007/978-981-13-1710-1_8-1

Bullough, R. V, & Pinnegar, S. *Guidelines for Quality in Autobiographical Forms of Self-Study Research*. *Educational researcher*, *30*(3), 13-21. https://doi.org/10.3102/0013189X030003013

Clarke, D., & Hollingsworth, H. (2002). Elaborating a model of teacher professional growth. *Teaching and Teacher Education*, *18*(8), 947–967. https://doi.org/10.1016/S0742-051X(02)00053-7

Cochran-Smith, M. (2005). Teacher educators as researchers: Multiple perspectives. *Teaching and Teacher Education*, *21*(2), 219–225. https://doi.org/10.1016/j.tate.2004.12.003

Cochran-Smith, M., & Donnell, K. (2012). Practitioner Inquiry: Blurring the Boundaries of Research and Practice. In J. Green, G. Camilli, & P. Elmore (Eds.), *Handbook of Complementary Methods in Education Research*. 3rd ed. Lawrence Erlbaum Associates, 503–518 http://ebookcentral.proquest.com/lib/oxford/detail.action?docID=446575.

Cohen, L., Morrison, K., & Manion, L. (2018). *Research Methods in Education* (8th ed.). Routledge.

Corlett, S., & Mavin, S. (2018). Reflexivity and Researcher Positionality. In C. Cassell, G. Grandy & A. L. Cunliffe (Eds.), *The SAGE Handbook of Qualitative Business and Management Research Methods: History and Traditions*. SAGE Publications, 377–398. https://doi.org/10.4135/9781526430212.n23

Corominas, J., & Vicens, J. A. (2024). *Xavier Zubiri. La soledad sonora* (2nd ed.). Arca21. Pensamiento.

Craig, C. J., & Curtis, G. A. (2020). Theoretical Roots of Self-Study Research. In J. Kitchen, A. Berry, S. M. Bullock, A. R. Crowe, M. Taylor, H. Guðjónsdóttir, & L. Thomas (Eds.), *2nd International Handbook of Self-Study of Teaching and Teacher Education* Springer, 1–40. https://doi.org/10.1007/978-981-13-1710-1_3-2

Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and conducting mixed methods research* (3rd ed.). Los Angeles: SAGE Publications.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (5th ed.). Los Angeles: SAGE Publications.

Dana, N. F., & Yendol-Hoppey, D. (2020). The reflective educator's guide to classroom research: learning to teach and teaching to learn through practitioner inquiry. 4th ed. Thousand Oaks: Corwin.

Dean, J., Furness, P., Verrier, D., Lennon, H., Bennett, C., & Spencer, S. (2018). Desert island data: an investigation into researcher positionality. *Qualitative Research*, *18*(3), 273–289. https://doi.org/10.1177/1468794117714612

Eisenhart, M., & Howe, K. (1992). Validity in Qualitative Research. In M. LeCompte, W. Milroy, & J. Preissie (Eds.), *The Handbook of Qualitative Research in Education*. Academic Press, 643–680.

Elliott, V. (2018). Thinking about the coding process in qualitative data analysis. *Qualitative Report*, *23*(11), 2850–2861. https://doi.org/10.46743/2160-3715/2018.3560

Finch, M. (2021). Making Sense of Methods: What Does Systematic and Intentional Practitioner Research Look Like? *Journal of Practitioner Research*, *6*(2). https://doi.org/10.5038/2379-9951.6.2.1195

Finch, M. (2022). Complexities of Practitioner Research: Seeking Hallmarks of Quality. *Impacting Education: Journal on Transforming Professional Practice*, *7*(3), 1–10. https://doi.org/10.5195/ie.2022.256

Foreman-Peck, L., & Heilbronn, R. (2018). Does Action Research Have a Future? A Reply to Higgins. *Journal of Philosophy of Education*, *52*(1), 126–143. https://doi.org/10.1111/1467-9752.12272

Foreman-Peck, L., & Winch, C. (2010). *Using educational research to inform practice: A practical guide to practitioner research in universities and colleges*. Routledge.

Foster, C. (2024). Methodological pragmatism in educational research: from qualitative-quantitative to exploratory-confirmatory distinctions. *International Journal of Research and Method in Education*, *47*(1), 4–19. https://doi.org/10.1080/1743727X.2023.2210063

Fowler, T. B. (1999). Introduction. In *Sentient intelligent*. The Xavier Zubiri Foundation of North America. https://doi.org/10.7551/mitpress/7415.003.0026

Gadamer, H.-G. (1975). *Truth and method*. Sheed & Ward.

Gilles, M., & Fives, H. (2015). Introduction. In H. Fives & M. G. Gill (Eds.) *International Handbook of research on teachers' beliefs*. Routledge, 1–10

Gorski, P. S. (2013). "What is Critical Realism? And Why Should You Care?" *Contemporary Sociology: A Journal of Reviews*, *42*(5), 658–670. https://doi.org/10.1177/0094306113499533

Gracia, D. (2017). *El poder de lo real: leyendo a Zubiri*. Triacastela.

Hamilton, M. L., Hutchinson, D., & Pinnegar, S. (2020). *Quality, Trustworthiness, and S-STTEP Research*. In J. Kitchen, A. Berry, S. M. Bullock, A. R. Crowe, M. Taylor, H. Guðjónsdóttir, & L. Thomas (Eds.), *2nd International Handbook of Self-Study of Teaching and Teacher Education*. Springer, 1–40. https://doi.org/10.1007/978-981-13-1710-1_10-1

Hammersley, M. (2008). Troubling criteria: A critical commentary on Furlong and Oancea's framework for assessing educational research. *British Educational Research Journal*, *34*(6), 747–762. https://doi.org/10.1080/01411920802031468

Hammersley, M. (2013). *What is qualitative research?* London: Bloomsbury Academic.

Hampson, T., & McKinley, J. (2023). Problems posing as solutions: Criticising pragmatism as a paradigm for mixed research. *Research in Education* 116(1), 124–138. https://doi.org/10.1177/00345237231160085

Heidegger, M. (1962). *Being and time*. SCM Press.

Heikkinen, H. L. T., de Jong, F. P. C. M., & Vanderlinde, R. (2016). What is (good) practitioner research? *Vocations and Learning*, *9*(1), 1–19. https://doi.org/10.1007/s12186-016-9153-8

Heikkinen, H. L. T., Huttunen, R., & Syrjälä, L. (2007). Action research as narrative: Five principles for validation. *Educational Action Research*, *15*(1), 5–19. https://doi.org/10.1080/09650790601150709

Heikkinen, H. L. T., Huttunen, R., Syrjälä, L., & Pesonen, J. (2012). Action research and narrative inquiry: Five principles for validation revisited. *Educational Action Research*, *20*(1), 5–21. https://doi.org/10.1080/09650792.2012.647635

Herr, K., & Anderson, G. L. (2005). *The action research dissertation: A guide for students and faculty*. SAGE Publications. https://doi.org/10.4135/9781452226644

Hitchcock, G., & Hughes, D. (1995). Research and the Teacher: A Qualitative Introduction to School-based Research (2nd ed.). Routledge. https://doi.org/10.4324/9780203424605

Husserl, E. (2001). *Logical investigations*. London: Routledge.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher*, *33*(7), 14–26. https://doi.org/10.3102/0013189X033007014

Kacen, L., & Chaitin, J. (2006). The Times They are a Changing": Undertaking Qualitative Research in Ambiguous, Conflictual, and Changing Contexts. *The Qualitative Report*, *11*(2), 209–228.

Kaushik, V., & Walsh, C. A. (2019). Pragmatism as a research paradigm and its implications for Social Work research. *Social Sciences*, *8*(9), 255 https://doi.org/10.3390/socsci8090255

Kotze, J., Fleisch, B., & Taylor, S. (2019). Alternative forms of early grade instructional coaching: Emerging evidence from field experiments in South Africa. *International Journal of Educational Development*, *66*(September 2018), 203–213. https://doi.org/10.1016/j.ijedudev.2018.09.004

Kraft, M. A., & Hill, H. C. (2020). Developing Ambitious Mathematics Instruction Through Web-Based Coaching: A Randomized Field Trial. In *American Educational Research Journal, 57(6*), 2378-2414. https://doi.org/10.3102/0002831220916840

Lamb, D. (2013). Promoting the case for Using a Research Journal to Document and Reflect on the Research Experience. *Electronic Journal of Business Research Methods*, *11*(2), 84–92. https://ro.ecu.edu.au/ecuworks2013/416

Letherby, G., Scott, J., & Williams, M. (2013). Objectivity and subjectivity in social research. SAGE Publications. https://doi.org/10.4135/9781473913929

Levin, B. (2015). The development of teachers' beliefs. In H. Fives & M. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 48–65). Routledge.

Levin, M. (2012). Academic integrity in action research. *Action Research*, *10*(2), 133–149. https://doi.org/10.1177/1476750312445034

Li, D. (2004). Trustworthiness of think-aloud protocols in the study of translation processes [Article]. *International Journal of Applied Linguistics*, *14*(3), 301–313. https://doi.org/10.1111/j.1473-4192.2004.00067.x

Lichtman, M. (2023). Qualitative Research in Education: A User's Guide (4th ed.). Routledge. https://doi.org/10.4324/9781003281917

Lincoln, Y. S., & Guba, E. G. (1982). *Establishing Dependability and Confirmability in Naturalistic Inquiry Through an Audit*. Retrieved from https://files.eric.ed.gov/fulltext/ED216019.pdf [Accessed 13 February 2022]

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry* (6th ed.). Los Angeles. SAGE Publications.

Lincoln, Y. S., & Guba, E. G. (1986). But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Program Evaluation*, *1986*(30), 73–84. https://doi.org/10.1002/ev.1427

Longhofer, J., & Floersch, J. (2012). The Coming Crisis in Social Work: Some Thoughts on Social Work and Science [Article]. *Research on Social Work Practice*, *22*(5), 499–519. https://doi.org/10.1177/1049731512445509

Lyons, N., & LaBoskey, V. K. (2002). Why narrative inquiry or exemplars for a scholarship of teaching? In N. Lyons & V. K. LaBoskey (Eds.), *Narrative inquiry in practice: Advancing the knowledge of teaching.* Teachers College Press, 1–27.

Maarouf, H. (2019). Pragmatism as a Supportive Paradigm for the Mixed Research Approach: Conceptualizing the Ontological, Epistemological, and Axiological Stances of Pragmatism. *International Business Research*, *12*(9), 1-12. https://doi.org/10.5539/ibr.v12n9p1

Maxwell, J. A., & Mittapalli, K. (2010). Realism as a stance for mixed methods research. In A. Tashakk ori & C. Teddlie (Eds.), *Handbook of mixed methods in social & behavioral research* (*2nd Ed.). SAGE,* 145-168.

Mayer, D., Dixon, M., Kline, J., Kostogriz, A., Moss, J., Rowan, L., Walker-Gibbs, B., & White, S. (2017). *Studying the Effectiveness of Teacher Education: Early Career Teachers in Diverse Settings*. Springer. https://doi.org/10.1007/978-981-10-3929-4

Mayer, D., & Oancea, A. (2021). Teacher education research, policy and practice: finding future research directions. *Oxford Review of Education*, *47*(1), 1–7. https://doi.org/10.1080/03054985.2021.1853934

McGrath, R. (2021). Journalling and memoing: reflexive qualitative research tools. In Joanna Crossman & Sarbari. Bordia (Eds.), *Handbook of qualitative research methodologies in workplace contexts.* Edward Elgar Publishing, 245–262.

Meyer, K., & Willis, R. (2019). Looking Back to Move Forward: The Value of Reflexive Journaling for Novice Researchers. *Journal of Gerontological Social Work* 62(5), 578–585. Routledge. https://doi.org/10.1080/01634372.2018.1559906

Montgomery, P., & Bailey, P. H. (2007). Field Notes and Theoretical Memos in Grounded Theory [Article]. *Western Journal of Nursing Research*, *29*(1), 65–79. https://doi.org/10.1177/0193945906292557

Mortari, L. (2015). Reflectivity in Research Practice. *International Journal of Qualitative Methods*, *14*(5), 160940691561804. https://doi.org/10.1177/1609406915618045

Mukumbang, F. C. (2023). Retroductive theorizing: a contribution of critical realism to mixed methods research. *Journal of Mixed Methods Research*, *17*(1), 93-114. https://doi.org/10.1177/15586898211049847

Nagel, T. (1986). *The view from nowhere*. Oxford University Press.

Newman, I., & Benz, C. R. (1998). *Qualitative-quantitative research methodology: exploring the interactive continuum*. SIU Press.

Oancea, A., & Furlong, J. (2007). Expressions of excellence and the assessment of applied and practice-based research. *Research Papers in Education*, *22*(2), 119–137. https://doi.org/10.1080/02671520701296056

Oliphant, S. M., & Bennett, C. S. (2020). Using reflexivity journaling to lessen the emic–etic divide in a qualitative study of Ethiopian immigrant women. *Qualitative Social Work*, *19*(4), 599–611. https://doi.org/10.1177/1473325019836723

Onwuegbuzie, A. J., & Leech, N. L. (2007). Validity and qualitative research: An oxymoron? *Quality and Quantity*, *41*(2), 233–249. https://doi.org/10.1007/s11135-006-9000-3

Oolbekkink-Marchand, H. W., van der Steen, J., & Nijveldt, M. (2014). A study of the quality of practitioner research in secondary education: impact on teacher and school development. *Educational Action Research*, *22*(1), 122–139. https://doi.org/10.1080/09650792.2013.854175

Orange, A. (2016). Encouraging Reflective Practices in Doctoral Students through Research Journals. *The Qualitative Report*, *21*(12), 2176–2190. http://nsuworks.nova.edu/tqr/vol21/iss12/2

Ormston, R., Spencer, L., Barnard, M., & Snape, D. (2014). The foundations of qualitative research. In J. Ritchie, J. Lewis, C. M. Nicholls, & Rachel Ormston (Eds.), *Qualitative research in practice* (2nd ed.). Los Angeles: SAGE Publishing, 1–26.

Ortlipp, M. (2008). Keeping and using reflective journals in the qualitative research process. *The Qualitative Report*, *13*(4), 695–705. https://doi.org/10.46743/2160-3715/2008.1579

Padgett, D. K. (2008). *Qualitative methods in social work research*. Thousand Oakes: SAGE publications.

Pring, R. (2015). *Philosophy of Educational Research* (3rd Ed.). Bloomsbury Academic.

Saldaña, J. (2014). Coding and Analysis Strategies. In P. Leavy (Ed.), *The Oxford Handbook of Qualitative Research.* Oxford University Press, 581–598. https://doi.org/10.1093/oxfordhb/9780199811755.013.001

Schutt, R. K. (2006). *Investigating the social world: the process and practice of research* (5th ed.). SAGE Publications.

Sen, A. (1993). *Positional Objectivity*. *22*(2), 126–145. https://www.jstor.org/stable/2265443

Stenhouse, L. (2013). What counts as research? In T. Booth, M. Masterton, P. Potts, & W. Swann (Eds.) *Curricula for Diversity in Education*. Routledge, 293-303.

Susen, S. (2015). From Modern to Postmodern Epistemology? The 'Relativist Turn.' In *The 'Postmodern Turn' in the Social Sciences*. London: Palgrave Macmillan. https://doi.org/10.1057/9781137318237_2

Tashakkori, A., Johnson, R. B., & Teddlie, C. (2020). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. SAGE publications.

Teddie, C., & Yu, F. (2007). Mixed methods sampling: A typology with examples. *Journal of Mixed Methods Research*, *1*(1), 77–100. https://journals.sagepub.com/doi/abs/10.1177/1558689806292430

Vanassche, E., & Kelchtermans, G. (2015). The state of the art in Self-Study of Teacher Education Practices: A systematic literature review. *Journal of Curriculum Studies*, *47*(4), 508–528. https://doi.org/10.1080/00220272.2014.995712

Westbroek, H., Janssen, F., Mathijsen, I., & Doyle, W. (2022). Teachers as researchers and the issue of practicality. *European Journal of Teacher Education*, *45*(1), 60–76. https://doi.org/10.1080/02619768.2020.1803268

Wodak, R. (2014). Critical discourse analysis. In C. Leung & B. Street (Eds.), *The Routledge Handbook of Discourse Analysis*. Routledge, 302–316 https://doi.org/10.4324/9780203809068-8

Wolf, Z. R. (2003). Exploring the Audit Trail for Qualitative Investigations [Article]. *Nurse Educator*, *28*(4), 175–178. https://doi.org/10.1097/00006223-200307000-00008

Zachariadis, M., Scott, S., & Barrett, M. (2013). Methodological implications of critical realism for mixed-methods research. *MIS quarterly*, 855-879. https://www.jstor.org/stable/43826004

Zeichner, K., & Noffke, S. (2001). Practitioner Research. In V. Richardson (Ed.), *Handbook of Research on Teaching.* Washington DC: American Educational Research Association, 298–329.

Zubiri, X. (1980). *Inteligencia sentiente. Inteligencia y realidad.* Madrid: Alianza Editorial.

Zubiri, X. (1982). *Inteligencia y logos*. Madrid: Alianza Editorial.

Zubiri, X. (1983). *Inteligencia y razón*. Madrid: Alianza Editorial.

Zubiri, X. (1999). *Sentient Intelligence*. The Xavier Zubiri Foundation of North America. https://doi.org/10.7551/mitpress/7415.003.0026

5. Article 2: Understanding the influence of continuous professional development on teachers' teaching beliefs

5.1 Abstract

Helping teachers grow professionally so that their beliefs evolve is essential to realise the educational change intended by official school reforms. However, little is known about the evolution of teachers' beliefs about teaching in response to in-service teacher education. This longitudinal study addresses this gap in research from a synergetic mixed-method approach, integrating the evolution of self-reported, implied, and enacted beliefs. The findings suggest the existence of three profiles of teachers: those who consistently enact the intended teaching beliefs (effectively adaptive), those who embrace but fail to enact them (reportedly adaptive), and those who oppose them (maladaptive). They also suggest that in-service teacher education largely loses its transformative power in the planning phase of teaching, before classroom practice. The study provides an innovative approach to understanding the influence of continuous professional development on educational change. Implications include the importance for policy, practice, and further research to focus on teaching beliefs.

Keywords: Continuous professional development · Teacher education · Teacher beliefs · Teaching beliefs · Team-Based Learning · Educational change

5.2 Introduction

System-wide school reform efforts towards constructivist curriculum approaches have been said to yield disappointing results in the anglosphere (Fullan, 2015; Bryk, 2015; Cuban, 2013) and also in Spain (López Rupérez, 2022; Monarca & Rappoport, 2013; Rodríguez-García & Arias-Gago, 2022). Spanish scholars contend that this is because the ever-changing educational laws resulting from political alternation have left teachers "virtually alone", and "official administrations are usually

absent" (Prats et al., 2019, p. 213) in the face of the challenge of effectively transforming classroom teaching practices. They assume that continuous professional development (CPD) helping teachers develop their "mindsets" and "reconsider themselves and their values" is a necessary condition for a real change in teaching practices (VanGronigen et al., 2023, p. 703). This conviction aligns with the growing body of literature contending that the beliefs held by teachers concerning their students, their practice, and themselves "influence how and why they may or may not change their practice to incorporate new curriculum, adopt new instructional strategies…" (Levin, 2015, p. 50). However, longitudinal studies on the development of teachers' beliefs at large are needed (e.g., Fives & Gill, 2015), and the influence of CPD on the evolution of teachers' beliefs about how best to teach remains virtually unexplored. This study addresses this gap in research, exploring the transformative potential of in-service teacher education by focusing on the evolution of the beliefs about teaching of 55 Spanish teachers in response to a two-year CPD programme.

5.3 Literature review

The evolution of teachers' beliefs in response to professional development initiatives appears to be central for effective educational change. Indeed, it has been said that the above-mentioned discouraging results of educational change efforts might be the consequence of ignoring that teachers' commitment is key for transformative CPD, the effectiveness of which ultimately depends on their lived experience in the face of uncertainty (Fullan, 2015; Goodson, 2001; King & Stevenson, 2017; Lee & Yin, 2011; Louis, 2007; Sahlberg, 2006; Troman & Woods, 2000). In this line, some researchers emphasise that non-superficial change necessitates the crystallisation of a new "set of beliefs" (Bryk, 2015, p. 468) and thus requires addressing not just teachers' skills (Alger, 2009; Levin, 2015) but also the development of their beliefs (Broughton et al., 2013; Fives et al., 2019; Gregoire, 2003). They contend that teachers' beliefs must be at the core of educational change efforts (e.g., Gibbons et al., 2018), as they orient their classroom practice (Ertmer et al., 2015; Fives et al., 2019; Fives & Buehl, 2012; Gilles & Fives, 2015; Hoffman & Seidel, 2015; Levin, 2015; Peck & Herriot, 2015; Skott, 2015; Tatto, 2019) and "should be a central concern of teaching and teacher education" (Levin, 2015, p. 48; after Ammon & Levin, 1993; Kagan, 1992; Shulman, 1986). This aligns with the

importance attached to them in the Teaching and Learning International Survey (TALIS; OECD, 2010, 2014, 2019) as well as with recent recommendations for future research in the field of teacher education (e.g., Mayer et al., 2017). Indeed, the climate created by the results of reform policies and their underpinning CPD have reinforced the generalised conviction that "holding teacher education accountable" is key for effective teacher training (Cochran-Smith et al., 2017, p. 572). However, this international policy of public accountability tends to assume a narrow, and even ideological approach to teacher education as a driver for economic development that may be "privileging particular types of research both in topic, method and purpose" (Mayer & Oancea, 2021, p. 3). Accordingly, research efforts should adopt a more inclusive approach to teacher education effectiveness, accounting for its actual complexity by going beyond the "`neutral´ indicators" used in public school improvement efforts such as student outcomes to include factors such as "teachers' attitudes and beliefs" (Mayer et al., 2017, p.24), the development of which is crucial for professional growth (Clarke & Hollingsworth, 2002; Desimone, 2009; Guskey, 2002; Merchie et al., 2018).

The centrality of teachers' beliefs for effective CPD becomes clear because the literature supports a bidirectional relationship between them and teaching practices, which entails that in-service teacher education can promote belief development by having teachers experience new teaching approaches. Scholars have contended four different perspectives: a) teachers' beliefs and teaching practice are detached (e.g., Liu, 2011); b) teachers' beliefs impact on teaching practice (e.g., Pajares, 1992); c) teaching practice impacts on teachers' beliefs (e.g., Guskey, 2002); and d) teachers' beliefs and practice interplay reciprocally (e.g., Richardson, 1996). However, the approach contending a reciprocal influence is the perspective most widely accepted in the field of teachers' beliefs (Fives et al., 2019) and has been said to be "more accurate" for both "preservice and practicing teachers", which makes it relevant to understand how this interaction may vary depending on belief type and on personal or contextual factors (Buehl & Beck, 2015, p. 70). Several studies have found that the cases with "greatest inconsistency" between beliefs and practices "may represent a natural part of teacher development", as they always occur in "beginning" teachers or teachers in transition from traditional to constructivist beliefs (Buehl & Beck, 2015, p. 72; after Basturkmen, 2012; Ertmer et al., 2012;

Ogan-Bekiroglu & Akkoç, 2009). Rather than a sign of disconnection between teachers' beliefs and practices, a significant level of incongruity might be a piece of evidence of their interaction and of possible belief change in response to CPD.

Nonetheless, the evidence supporting the development of teachers' beliefs in response to CPD is inconclusive, as research into them has some important limitations. Firstly, while this field of research emerged in the 1980s as a response to the challenges posed by reform approaches inspired in constructivism (Ashton, 2015) and includes "a broad range of research" (Fives et al., 2019, p. 2), the pervasive ambiguity of the very notion of teachers' beliefs requires that researchers pay particular attention to conceptual clarification (Fives et al., 2015). In this sense, reviewers echo Pajares (1992) in emphasising that the very notion of teachers' beliefs remains "messy", as researchers have used diverse terms coming from different theoretical backgrounds and blended different types of beliefs in their analysis, thus making it difficult to compare findings (Fives et al., 2019; Fives & Buehl, 2012; Gill & Hardin, 2015; Levin, 2015). Within the field of teacher education, they are commonly defined as a psychological construct that conveys "the cognitive basis for the articulation of values and behaviors that mediate teaching practice" (Tatto, 2019, p. 1), assuming that they are a value-laden and behaviourally influential form of cognition.

Secondly, some authors claim that this definition ignores the close relationship between beliefs and emotions (Nespor, 1987; Frijda & Mesquita, 2000; Gill & Hardin, 2015; Siwatu & Chesnut, 2015; Watt & Richardson, 2015), as well as the crucial role of the latter in belief development (Ashton & Gregoire-Gill, 2003; Fives et al., 2019), thus remaining "coldly cognitive"(Gill & Hardin, 2015, p.230). Yet, research into the nature of this possible relationship from a post-cognitivist approach is still in its infancy (Bächler et al. 2018; Cheung & Hennebry-Leung, 2020; Egloff & Souvignier, 2020). Thirdly, teachers' beliefs are particularly elusive, as they are not directly observable and must be indirectly inferred (Hoffman & Seidel, 2015). Fourthly, research into them is mainly small-scale, and "belief data are typically self-report data" (Levin, 2015, p. 60). Finally, investigation into teachers' beliefs throughout their entire careers does not exist, and longitudinal research analysing specifically their evolution and development over time is scarce (Fives & Buehl, 2012). Accordingly,

there is a “pressing need” for studies addressing the development of teachers’ beliefs, its possible drivers, and its enaction in teaching practices (Levin, 2015, p. 61). .

While the literature does not provide a precise taxonomy of teachers’ beliefs, it consistently addresses specific subsets regarding aspects such as self-efficacy, professional growth, school system, student performance, and the desirable teaching approach (Wang et al., 2024). Concerning the latter, researchers have used different expressions such as “beliefs about teaching” (Fives et al., 2019), “beliefs about teaching and learning” (Hancock & Gallard, 2004), “pedagogical beliefs” (Levin, 2015), “educational beliefs” (Tondeur et al., 2008) , “epistemological beliefs” (Gill et al., 2004) or “teaching conceptions” (Mladenovici et al., 2024). This study refers to these beliefs about how best to teach as teaching beliefs (TBs), which orient classroom practices (Fives & Gill, 2015; Gibbons et al., 2018; Inan & Bolliger, 2024; Mazhar et al., 2021; Tondeur et al., 2017) and act as filters for the effectiveness of CPD (Buehl & Beck, 2015; Kagan, 1992; Levin, 2015; Nespor, 1987; Pajares, 1992).

Reviewers contend that this type of beliefs concerning the best teaching method has been of interest for researchers since decades, highlighting the existence of “much debate in the literature” about two conceptualisations (Valckx et al., 2021, p. 2). A bi-polar approach argues for a dichotomy between two opposing pedagogic “paradigms” expressed in multiple ways. The most common is traditional vs constructivist (Tondeur et al., 2008), but there are other expressions such as transmission vs constructivism (Klieme & Vieluf, 2009), teacher- vs student-centred (Teo et al., 2008), and content- vs student-oriented (Meirink et al., 2009). This polarised approach assumes that constructivism and direct transmission are opposing poles of a continuous scale where TBs can be located according to closeness to constructivism. An alternative approach assumes that teachers have two distinct yet complementary belief structures that coexist and combine in different ways (e.g., de Vries et al., 2014). The two poles of the dychotomous approach are seen as two independent “dimensions” concerning “subject matter-oriented beliefs and student-oriented beliefs” (p. 344). The former corresponds to content-centred, “traditional teaching”, and the latter refers to competence-led, “constructivist teaching” (Tondeur et al., 2008, p. 2544; also Woolley & Benjamin, 2004). In contrast to the bi-polar approach, this perspective is consistent with the empirical evidence that teachers can

hold multiple and sometimes contradictory TBs, the activation of which might depend on contextual factors (Cheng et al., 2009; Snider & Roehl, 2007; Verjovsky & Waldegg, 2005).

The limitations of research into the development of teachers' beliefs at large mentioned earlier also apply to change in TBs. Most studies address the influence of teacher education programmes in pre-service teachers, are qualitative, draw on self-reported data, and are of small or very small scale, thus resulting hardly scalable and generalisable. For example, Dang's et al. (2024) study supports the claim that TBs do change and that this change can be categorised in a continuum of 6 levels from "confirmation" to "reversal" of the initial TB, but it is based only 3 pre-service teachers. It is true that some scholars have explored the evolution of the TBs of in-service teachers in response to CPD, documenting a shift towards constructivism in enacted beliefs (e.g., Goodnough, 2008) or reporting that this change took place in both professed and enacted TBs, thus emphasising that teachers ended up holding contradictory beliefs (e.g., Levin & Wadmany's, 2006). However, these studies tend to be not only of small scale, but also domain-specific. In fact, current research remains domain-specific (Valckx et al., 2021), focusing on change in TBs within subjects such as technology, mathematics, science, or language teaching. Concerning technology, qualitative studies provide evidence of a shift towards constructivism in both reported and enacted TBs in response to CPD (Tondeur et al., 2017), and the enaction of new TBs is more likely to happen in teachers whose constructivist orientation is predominant (Choi et al., 2023), although a degree of discrepancy between more constructivist reported and more traditional enacted TBs exists (Inan & Bolliger, 2024). Similar patterns appear to occur in mathematics (Barkatsas & Malone, 2005; Lane & Ní Ríordáin, 2020), language teaching (Barcelos, 2024; Gao & Zhou, 2021), and sciences (Caleon et al., 2018; Erduran & Kaya, 2018).

However, while needed, no small-scale, generally oriented studies that could explore the possible existence of these patterns in response to CPD are virtually non-existent. They would provide holistic insights of greater applicability across schools, educational settings, and change strategies. They would also be more likely to influence the decision-making of policy makers and school leaders, as well as to contribute to the development of conceptual frameworks improving our understanding of educational change and guiding further research. This longitudinal study addresses this gap, aiming to

understand the development of TBs in response to CPD. Particularly, it explores the following research questions:

a) How did TBs evolve in response to a two-year CPD programme seeking educational change?

b) How far did this evolution point to the intended change, if at all?

c) To what extent could this evolution vary according to some demographic variables?

5.4 The professional development initiative

5.4.1 Team-Based Learning

The CPD programme addressed by this study relied on the conviction that having teachers experience the advantages of an active teaching method such as Team-Based Learning (TBL) could help them develop their TBs and thus complement their teacher-centred lecturing focused on transmitting content with more competence-led teaching practices. TBL is claimed to deliver a "paradigm shift" towards a constructivist teaching approach (Sibley & Parmelee, 2008, p. 47; also Roberson & Franchini, 2014; Hrynchak & Batty, 2012; Kubitz, 2014; Wanzek et al., 2014) perfectly aligned with the educational change that the school federation was seeking to promote.

However, adopting TBL entails "a steep learning curve" (Nelson & Tweddell, 2017, p. 103) concerning teachers' practice both during and before classroom time. Indeed, far from remaining on the surface, this methodology is said to completely transform the role of students and teachers, who transition from being instructors to learning facilitators (Fatmi et al., 2013; Haidet et al., 2014; Michaelsen & Sweet, 2011; Parmelee & Michaelsen, 2010; Reimschisel et al., 2017; Sisk, 2011) by following a clear, structured sequence of actions (Figure 20). TBL flips the classroom and, after a brief test-based process aimed at ensuring that students come prepared to class, devotes the bulk of classroom time of every unit to have students solve real problems by applying theoretical content in small teams that are stable for the whole semester. In every problem or activity, each team must discuss and decide their preferred solution from 4-5 specific options given previously by the teacher, report this decision simultaneously and then justify it in inter-team, plenary discussions to eventually

uncover the best solution. At the end of the semester, students evaluate the performance of their teammates to maximise their engagement and accountability.

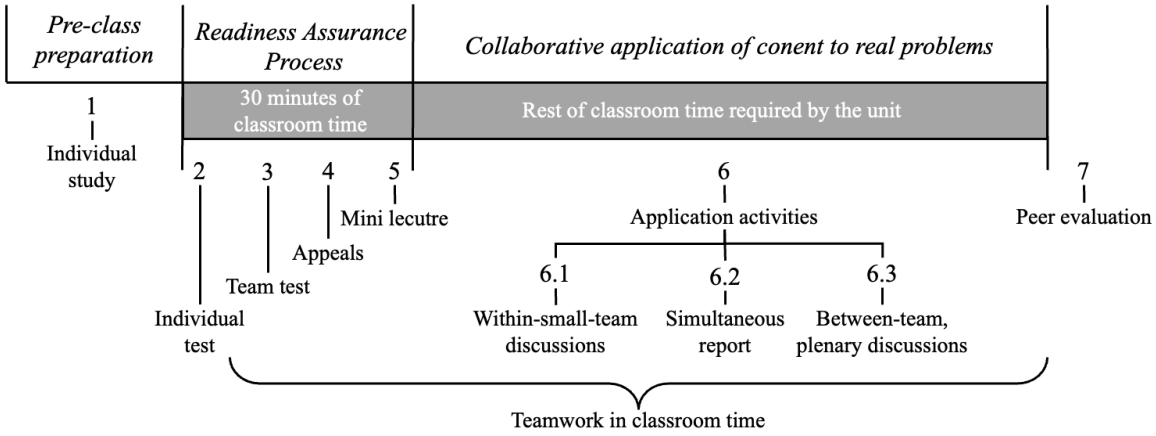


Figure 20: structured sequence of actions in a TBL unit, adapted from Michaelsen et al. (2011)

Yet, the successful implementation of these class dynamics requires planning lessons backwards (e.g., Parmelee et al., 2012), which often challenges the "beliefs about teaching" enacted by teachers in the pre-class phase of teaching (Sibley & Ostafichuk, 2014, p. 4), thus requiring specific training. Firstly, teachers define the intended student learning outcomes of the lesson; then, they create real-world problems to help students achieve these outcomes collaboratively; afterwards, they identify the theoretical content necessary to solve these problems and create a test; and only finally, they determine and produce the resources necessary for students to study this content and come prepared for this test.

5.4.2 The CPD programme

The CPD programme promoting TBL was framed within a wider, multi-stage educational change effort focused on the professional development of over 200 baccalaureate and vocational education teachers from 11 state-sponsored schools which are spread throughout Spain under the umbrella of a school federation. The first stage of the programmatic change effort was aimed at exploring the suitability of TBL for high school by designing and implementing a blended, long-term CPD programme. Following Styron et al., (2015) and Estis (2017), the school federation assumed that change in educational settings is a particular form of organisational change at large, turning to

organisational development theory (Kotter, 2012; Litman, 2006; Rogers, 2003). This stage aimed to engage first “innovators” (12 teachers) and then “early adopters” (40 teachers), yielding very encouraging results, as they greatly welcomed the CPD programme (self-reference). These results were then supported by an international replication of the programme with 10 teachers from Spain, England, and Ireland, who reported improved student learning outcomes and increased job satisfaction (self-reference). Nonetheless, the actual power of this CPD programme for the development of TBs and thus for educational change was still unclear because all 52 teachers volunteered to participate and were a priori willing to improve their teaching practices. It might well have been the case that the CPD programme just provided them with an operational tool for applying the TBs that they already had, rather than for developing them.

This study addresses the second stage aiming to engage the early majority of the 11 schools in a two-year CPD programme, focusing on teachers who seldom lead educational innovations but are open to adopt them once they see that these innovations do work. The 55 participants were voluntarily recruited from this group of potential participants previously selected by headteachers, teaching over 15 subjects and covering all the career stages included in Huberman’s (1992) approach to teacher development. Given the multi-site nature of the intervention and the financial limitations of the school federation, the programme could not include the observation of classroom practices, thus focusing on helping teachers design and pilot six termly TBL lesson plans and then reflect on their experience. It combined 1.5-day, in person training on TBL with timely, personalised mentoring throughout 2 academic years within an online community (Figure 21). In the initial in-person training, participants went through the whole sequence of actions structuring a TBL unit (including peer evaluation) as if they were students for them to internalise the learning experience provided by TBL. Then, they started the design of their first TBL lesson plan using a tailor-made template under the supervision of the mentor (the lead researcher). In the subsequent online mentoring process, participants created and shared another 5 lesson plans, received feedback from the mentor, implemented them and reflected on their experience with the new teaching practice (Figure 22), building a final bank of resources available for every member of the online community. In being sustained, experiential, personalised,

reflective, and blended, the programme met the requirements usually listed in reviews of effective CPD (Borko, 2004; Darling-Hammond et al., 2017; Langelaan et al., 2024; Parsons et al., 2019; Sims & Fletcher-Wood, 2021; Starkey et al., 2009; Fairman et al., 2023), addressing all the domains conforming Clarke & Hollingsworth's (2002) IMTPG.

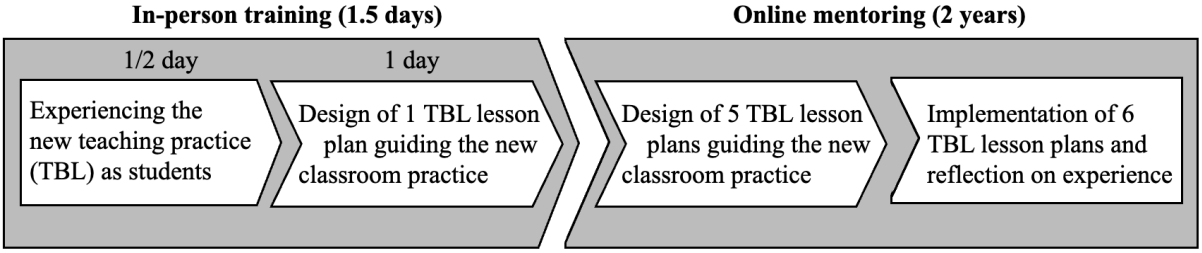


Figure 21: structure of the 2-year CPD programme

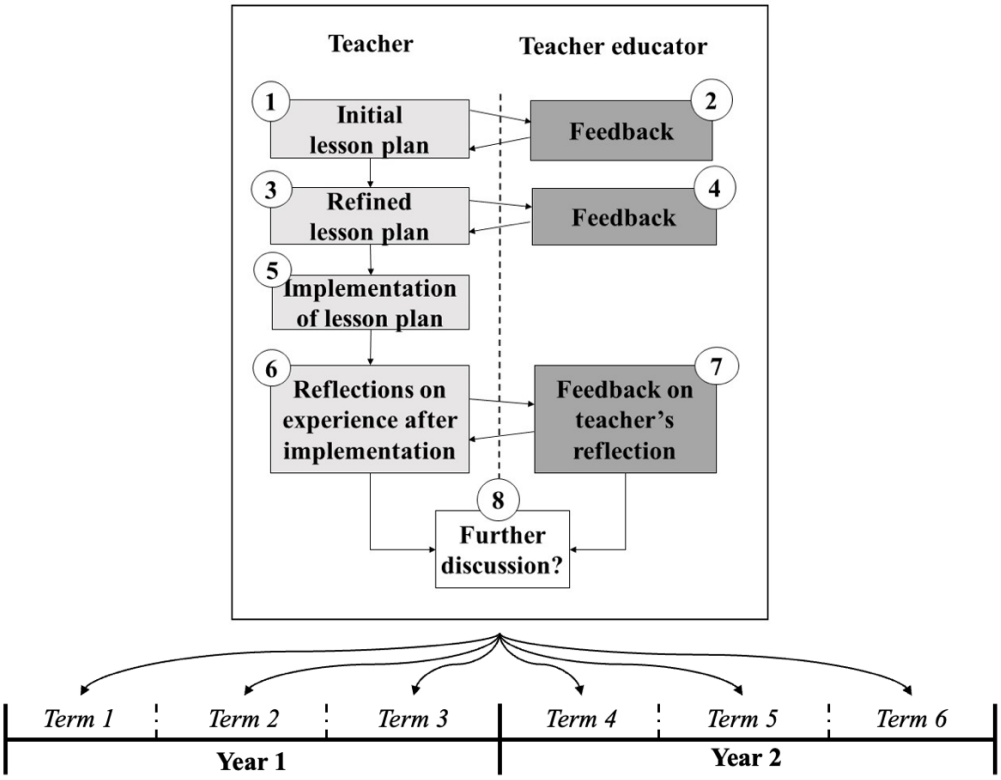


Figure 22: structure of the termly online mentoring

5.5 Theoretical framework

We draw on de Vries' et al. (2013, 2014) definition of TBs as "propositions about learning and teaching that a teacher holds to be true, which in turn guide to her or his thought and behaviors" (de Vries et al., 2013, p. 81), whose conceptualisation builds on 4 pillars. Firstly, TBs are truth-oriented, value-laden, concious or unconscious, and behaviorilly influential cognitions (Borg, 2001). Secondly,

these cognitions are flexible and develop over time (Bolhuis, 2000; Hargreaves, 2000; Kelchtermans, 2008). Thirdly, while malleable, they become more robust over time (Murphy & Mason, 2006; Pajares 1992). Finally, teachers simultaneously hold two different belief structures responding to two teaching method approaches with different goals, roles, and classroom dynamics (OECD, 2009; Tondeur et al., 2008; Van Driel et al., 2007). Indeed, "subject matter-oriented beliefs" conform a behaviourist perspective, attaching importance to the "transmission" of content to be covered by the teacher, who is "the knowledge expert and deliverer of knowledge" in the classroom, does not encourage students' active participation or collaboration, and prioritises the class as a "whole" over their individual needs (de Vries' et al., 2014, p. 339). "Student-oriented beliefs", in contrast, are closer to constructivism, focus on "the development of skills and competencies" and consider the teacher as a facilitator who fosters individual learning by encouraging active participation through collaboration (p. 340). The former foster "peace and concentration in the classroom" to help students follow instructions and learn to reproduce the knowledge transmitted, whereas the latter prioritise the creation of "stimulating, challenging" environments that foster students' initiative to help them construct their knowledge (Valckx et al., 2024, p. 1004). Both belief orientations correspond to 2 different forms of using classroom time coined as "traditional teaching", direct instruction or lecturing, and "constructivist teaching" or active pedagogies respectively (Tondeur et al., 2008, p. 2547; after Woolley & Benjamin, 2004; also Valckx et al., 2024) and combine with different strengths in every teacher, giving rise to groups of profiles of teachers with "relatively homogeneous… scores on the two belief scales" (de Vries et al., 2014, p. 347).

Accordingly, we assume that TBs are forms of cognition about how classroom teaching practice should be, of which teachers may or may not be aware but which guide their classroom practice, develop over time, and are structured in two distinct, complementary dimensions combining differently in every teacher: a traditional orientation and a constructivist orientation. The coexistence of these two orientations allows teachers to alternate traditional and constructivist practices, in line with scholars contending that contextual factors determine the TBs enacted by them (Beswick, 2005; Lane & Ní Ríordáin, 2020). This conceptualisation avoids the issue of teachers holding incompatible TBs derived from the polarised approach, which considers these orientations as two opposed,

incompatible poles of a single continuum and understands TBs according to their closeness to one of these poles by locating them in a specific place along this continuum.

5.6 Methodology

This multi-site case study draws on Zubiri's (1980, 1982, 1983, 1999) subtle realism and adopts an interpretive epistemology enabling to strive for a rigorous and trustworthy interpretation in the purpose of understanding the evolution of TBs. The position of the main researcher as the teacher educator of the CPD programme did not permit to totally exclude possible vested interests. However, we strove to validate the findings and maximise their trustworthiness by following Lincoln & Guba's (1986) framework for trustworthiness in naturalistic enquiry as well as some of the strategies maximising trustworthiness that are available in the literature (Anney, 2015; Onwuegbuzie & Leech, 2007). Particularly, we used a digital, reflective research journal to ensure transferability through a detailed account of every single step of the research process, as well as to maximise confirmability and dependability through reflection and exhaustive audit trails. In the following subsections we clarify the strategies followed to increase rigour in data collection and analysis, as well as to address possible ethical issues. The study obtained ethical approval from the university where the main researcher is affiliated before data collection.

5.6.1 Data collection

5.6.1.1 Mixed-method approach

Teachers' beliefs are particularly elusive, subjective, "intangible constructs" (Tatto & Coupland, 2003, p 124) that "cannot be directly observed or measured but must be inferred from what people say, intend, and do" (Pajares, 1992, p. 314) and of which teachers may be "conscious (explicit) or unaware (implicit or tacit)" (Fives & Buehl, 2012, p. 473). Some authors contend the necessity for researchers to combine different data collection strategies "in innovative ways to meet the[ir] specific goals" (Schraw & Olafson, 2015, p. 95), highlighting that the use of mixed methods is "a strength", particularly concerning belief development (Levin, 2015, p. 59). Following these recommendations, we collected data from 3 different perspectives: a) reported TBs in teachers' self-appraisal, b) implied TBs in their reflections, and c) enacted TBs in the planning phase of teaching. All the data were

collected separately and simultaneously from the same teachers throughout the programme. Perspectives a) and b) concern the value attached by teachers to the intended teaching practice, whereas c) concerns teachers' implementation of this practice independently of the value attached by them to it.

5.6.1.2 Validated questionnaire

Despite the controversy about the suitability of psychological measurement (Maul et al., 2016), "questionnaires are the most common assessment data collection strategy used in teachers' belief research" (Schraw & Olafson, 2015, p. 91) and "abound" in the field (Hoffman & Seidel, 2015, p. 117). Moreover, questionnaires using a Likert scale have been the only method of data collection used within the theoretical framework informing this study. To have teachers express their TBs, we used an adaptation of Arancibia's et al. (2020a, 2020b) version of de Vries' et al. (2013, 2014) reliable, validated questionnaire allowing the identification of the levels of the traditional and constructivist orientations. This version translates the original Dutch into Spanish, adapting the four-point rating scale asking for applicability (1 = `not applicable´, 2 = `somewhat applicable´, 3= `fairly applicable´, 4 = `fully applicable´) to a finer-grained, six-point Likert scale measuring the importance of the item content for respondents (1 = `not important at all´; 2 = `of little importance´; 3 = `moderately important´; 4 = `important´; 5 = `very important´; 6 = `absolutely essential´), which better suits the detection of smaller variations.

We adapted the questionnaire to the institutional culture and language of the school federation to ensure that participants understand all the items appropriately and administered it to a population of 274 secondary teachers from the 11 participant schools, using a unique link for every teacher to enable individual tracking. In total, 226 teachers completed the questionnaire at baseline and after-year 2, representing 82.5% of the initial sample, markedly higher than the average response rate for an online survey (Sheehan, 2001). The sample included two subsamples to enable a comparison group: the 55 participants who completed the CPD programme out of the 60 teachers initially enrolled, and another 171 teachers who were not included in it (Table 7).

Table 7: demographics of participants

	Whole sample (n=226)		CPD programme (n=55)		No CPD programme (n=171)	
Gender						
Female	157	69.5%	31	56.4%	126	73.7%
Male	69	30.5%	24	43.6%	45	26.3%
Teaching experience						
Mean of years	18.9		12.7		20.1	
1-3 years	10	4.4%	4	7.3%	6	3.5%
4-6 years	15	6.6%	7	12.7%	8	4.7%
7-18 years	78	34.5%	22	40%	56	32.7%
19-30 years	84	37.2%	17	30.9%	67	39.2%
>30 years	37	16.4%	5	9.1%	32	18.7%
No data	2	0.9%	0	0%	2	1.2%
Discipline						
STEM	81	35.8%	19	34.5%	62	36.3%
Others	145	64.2%	36	65.5%	109	63.7%

To minimise the issue of social desirability bias, which is a pervasive limitation of research into teachers' beliefs based on self-reported data, particularly when using questionnaires (Hoffman & Seidel, 2015), the questionnaire was voluntarily completed online (De Vaus, 2014; Krosnick & Presser, 2010), it included the stem "In my teaching…" to introduce the items ordered at random (de Vries et al., 2014), and participants were informed that all the steps would be taken to ensure confidentiality and anonymity during the data processing. Moreover, the "persistent observation" and "prolonged engagement" of the main researcher with participants throughout 2 years most probably contributed to developing mutual trust, and to building rapport and participants' necessary confidence to answer realistically (Lincoln & Guba, 1986).

5.6.1.3 Reflective writings in online portfolios

From among all the qualitative data collection instruments compiled by scholars within the field of teachers' beliefs (Schraw & Olafson, 2015; Hoffman & Seidel 2015), self-reflective writings and electronic portfolios were particularly suitable for this study, as they occurred naturally in the CDP programme. Teachers' termly feedback on the online community of practice including reflections, comments, and lived experiences during the mentoring process represented self-reflective writings gathered in weblog entries that addressed factors influencing beliefs. This feedback occurring in 6 cycles across 6 three-month scholar terms represented a sort of electronic portfolio, "a collection of

work that demonstrates achievement, effort, and growth over time" (Schraw & Olafson, 2015, p. 94). The use of online forums to collect data proved to be efficient in previous stages of the CPD programme, as the feedback during the mentoring process was a privileged scenario for sharing concerns and emotions spontaneously. Moreover, electronic portfolios on online forums have the advantage of automatically saving data "in chronological order" (Saldaña, 2003, p. 19). The collection of participants' comments started just after the initial face-to-face training phase with a prompted reflection on their experience in it, and it progressed throughout years 1 and 2 as far as they were sharing and piloting their lesson plans. We copied the conversation threads hosted in the individual channels of the community of practice and pasted them in 55 Microsoft Word files with eight pages on average, following the chronological order, including the date and time of every comment, and anonymising the participants. These files constituted reflective narrative accounts gathered through electronic portfolios.

5.6.1.4 Artifacts in the form of lesson plans

Teachers' response to the CPD programme manifested in two ways: the design of TBL units and their implementation in the classroom. Observations of classroom teaching practices are usual in research into teachers' beliefs (Olafson et al., 2015), but they were not part of the CPD programme for logistical and financial limitations. Moreover, video recordings were beyond the time and resource limitations of the study and might also have been unduly intrusive. However, the collection of termly TBL units and their successive drafts occurred naturally during the mentoring process. As TBL requires the development of the TBs informing teachers' practice not only during classroom time but also in the planning phase of teaching, we strove to elicit how teachers enacted their TBs in this pre-class phase, particularly in the first draft of the 244 TBL lesson plans submitted during the CPD programme. From the 55 teachers who remained in the organisation and completed the CPD programme, 20 of them managed to submit the expected 6 TBL lesson plans, 8 teachers submitted 5, 11 teachers submitted 4, and the remaining 16 teachers were able to submit fewer than 4 lesson plans for different reasons, including being off work or progressive disengagement from the programme. The number of lesson plans submitted by teachers, along with the amount of their comments and their

reflective character, diminished progressively throughout the 2 years of CPD programme (142 in year 1, and 102 in year 2).

5.6.2 Data analysis

5.6.2.1 Synergetic mixed-method approach

We followed Day's et al., (2008) approach, seeking synergy rather than triangulation, conducting the analysis in 2 phases. In phase 1, we adopted a person-centred approach, tracking every single teacher individually throughout two academic years. To do so, we drew on flexible a priori coding and quantification to capture the evolution of TBs quantitatively from every perspective in the form of three variables by translating the hierarchical order of the codes capturing the degree of change into an ordinal scale that uses numbers. To maximise the robustness and rigour of coding we took the following steps: a) theoretical alignment to ensure that the "preset codes" (Elliott, 2018, p. 2855) were rooted in established theory and empirical research: b) development of detailed coding frameworks to define every code clearly and ensure consistency; c) pilot testing of these definitions to look for limitations, gaps, overlapping or vagueness as far as the longitudinal study progressed; d) sensitivity checking of these definitions by comparing the impact of small changes on the findings; e) iterative refinement by reconsidering and revising the codes at different moments of the longitudinal analysis in the light of pilot testing and sensitivity of analysis; f) audit trail recording in a digital research journal with incremental backups to maximise transparency, replicability, confirmability, and public scrutiny; and g) drawing on expert review by critical friends, when possible.

As previous research suggests that change in teachers' beliefs may or may not occur and, if it does, can be "adaptive" or "maladaptive" (Girardet, 2018, p. 6; also Buehl & Beck, 2015), a minimum of three codes was necessary. However, as more alignment than misalignment was expected, we distinguished four codes: adaptive change, slightly adaptive change, no change, and maladaptive change. To define them rigorously, we followed Corbin & Strauss' (2015) framework, considering them as categories with properties and dimensions. We interpreted the scarcity of participants' comments and the submission of a low number of lesson plans as a sign of teachers' progressive disconnection from the CPD programme and thus as the absence, or irrelevance, of change in TBs.

In phase 2, we quantified these four codes using the same scale in all three perspectives to make them comparable, obtaining three variables per teacher. Quantification or "quantitizing" is "the numerical translation, transformation, or conversion of qualitative data" (Sandelowski et al., 2009, p. 208), which "can add more dimension to the analysis" and "provides *analytic texture"* (Miles et al., 2020, p. 35, emphasis in original). We drew on Onwuegbuzie's (2025, 2024) "DIME-Driven Model of Quantizing" and, particularly, on its "exploratory-based quantitizing" type, which quantifies codes to group participants and find patterns for the purpose of enhancing the understanding of the findings without oversimplifying qualitative data. It allowed us to conduct cluster analysis to better understand the educational change driven by the CPD programme by uncovering profiles or groups of teachers showing homogeneous patterns in the evolution of their TBs (Figure 23).

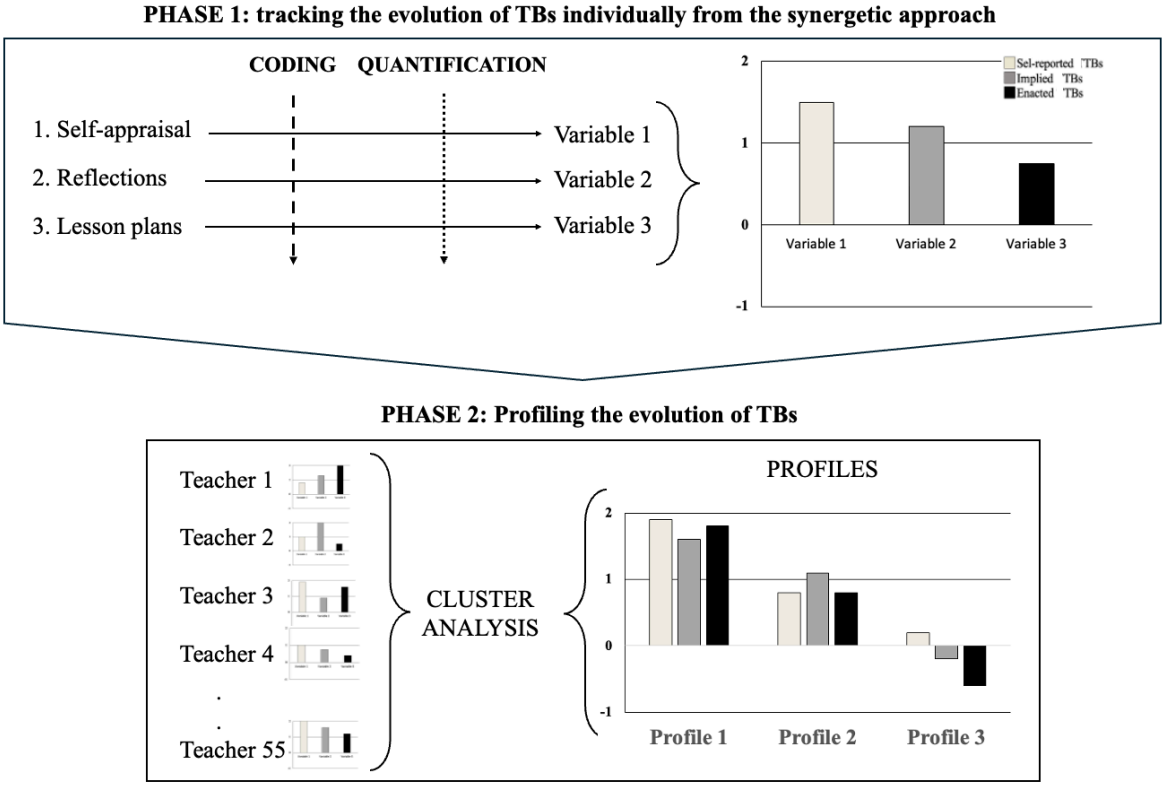


Figure 23: synergetic approach to data analysis looking for profiles

As cluster analysis calculates distances between data points, and one of the 4 codes labelled the absence of change, we opted for a ratio scale with 4 values ordering codes with equal intervals between them and a true zero point. Moreover, as the codes labelled adaptive and maladaptive change, we used a scale with positive and negative values. As we expected more alignment than misalignment

with the intended change, this four-level scale was asymmetrical, attributing two positive values to allow the distinction of 2 degrees of positive change, thus "preserv[ing] the shades of gray in the qualitative data" (Sandelowski et al., 2009, p. 217): -1=`maladaptive change´, 0 =`no change´, 1=`slightly adaptive change´, and 2=`adaptive change´. It is true that the distance between the values labelling the four codes was not necessarily constant, but the aim was neither numerical precision nor comparisons with previous datasets, and the values respected logic.

5.6.2.2 Enacted TBs: lesson plans

While we were not able to witness teachers' implementation of the 244 TBL lesson plans collected, we could elicit how the constructivist and traditional orientations guided their approach to the planning phase of teaching by examining the initial drafts of these plans, which were not yet influenced by the mentor's feedback. To maximise reliability and validity, we counted on critical friends in two ways. Firstly, we compared our analysis of the quality of 12 TBL lesson plans with that conducted by 4 TBL mentors (three plans per critical friend), finding complete or strong consistency in 11 of them. We then developed the coding framework to elicit the levels of constructivist and traditional orientation informing the lesson plans by turning to three senior TBL Consultants: the creator of TBL, the President of the global TBL community, and the President of its European section. We coded the initial draft of each one of the 244 lesson plans and then quantified this coding as far as participants shared them in the community of practice. To ensure consistency, we re-analysed all of them within a week, once data collection was finished. Secondly, we inferred the evolution of the TBs enacted in the lesson plans in every participant, which could be "progressive" and "developmental" towards the intended increase in the constructivist orientation or "stall for a while and go forward or backward" (Corbin & Strauss, 2015, p. 176) without linear progression. To do so, we developed a coding framework allowing us to discern four types of evolution in TBs: a) participants consistently adapted to the changes required by the constructivist approach; b) they adapted to these changes in some cases only; c) they tried to adapt but did not succeed; and d) they did not try to adapt at all.

5.6.2.3 Implied TBs: teachers' reflections

Teachers' reflections throughout 2 academic years allowed us to elicit the evolution of their stance on the constructivist practices both before and during classroom time. We developed a coding framework assuming that the evolution of teachers' stance can be uncovered by focusing on five properties with different dimensions. Firstly, the lack of reflections would show the rejection of the type of learning experience underwent in the face-to-face training and thus a maladaptive, negative influence in TBs. Secondly, the degree of newness of TBL for participants' usual teaching practice allowed us to discriminate whether their TBs underwent a change in response to the programme or was just reinforced by it. Finally, the degree and the direction of this possible change in stance was shown by another three properties: a) the type and strength of emotions, which seemed to be determinant in previous stages of the programme and are considered to be "the most important component of belief change" by some scholars (Ashton & Gregoire-Gill, 2003. P. 107); b) the balance between advantages and disadvantages found by participants; and c) participants' prospect of extending, maintaining, or reducing the implementation of the TBL lesson plans already piloted. Then, we quantified this evolution following the above-mentioned 4-level scale. To maximise consistency, we tried to ensure that the same or similar pieces of evidence led us to select the same code or category. We coded all 55 narrative accounts in a row, and then we reviewed them per codes, trying to find doubtful cases before making a final decision about the final code.

5.6.2.4 Self-reported TBs: teachers' self-appraisal

We first calculated the level of the traditional and constructivist orientations at baseline and after year 2. As our theoretical framework considered that both beliefs orientations are compatible and complementary, and the aim of the CPD programme was to increase the constructivist orientation rather than to decrease the traditional one, the properties of the coding framework primarily focused on changes in the level of the former, whereas dimensions concerned the consistency of these changes across the three measurements. As participants' self-appraisal was an ordinal variable measured through a Likert scale, we explored how far the results of the questionnaire could have been associated with their participation in the CPD programme by applying the Mann-Whitney *U* test.

Particularly, we compared mean ranks rather than medians between participants and non-participants in the CPD programme, as the assumption of equal distribution shapes of the baseline scores between both groups was not met in any of the two belief orientations.

5.6.2.5 Integration of perspectives: profiling change in TBs through cluster analysis

Once we had captured the evolution of TBs in every teacher using 3 variables (one per perspective), we turned to hierarchical cluster analysis to explore the possible existence of profiles. One of the advantages of hierarchical clustering is the generation of a dendrogram which can be used to graphically identify the optimum number of clusters without specifying it in advance. Furthermore, one of the benefits of the K-means algorithm, the most popular partitioning technique, is that it succeeds in avoiding overlapping clusters (Omran et al., 2007). Accordingly, we followed de Vries' et al., 2014 approach, using first Ward's agglomerative hierarchical method to identify the appropriate number of clusters. Ward's method starts assigning every teacher to one cluster, merging them iteratively based on the Euclidean distance to the closest cluster until all participants are assigned to an overarching cluster. This procedure tends to generate a balanced dendrogram with roughly equal groups and helped us identify the most meaningful number of clusters. Then, we ran the K-means algorithm to define the clusters. Finally, we explored the possible association of the evolution of TBs with demographic variables by examining how teachers distribute across profiles depending on gender, discipline, type of schooling, career stage, and school.

5.7 Findings

5.7.1 Profiles of the evolution of TBs

Before conducting clustering analysis, we explored how far the evolution of self-reported TBs could have been associated with teachers' participation in the CPD programme, but we did not find evidence of a statistically significant association either in the constructivist (U = 4505.0, N1=55, N2=170, p = 0.7, two-tailed) or in the traditional orientation (U = 4015.0, N1=55, N2=170, p = 0.1, two-tailed). The dendrogram obtained pointed to the existence of three distinct groups of teachers, and the K-means algorithm confirmed that the distinction of three profiles (Figure 24) was stable, strong, and robust for three reasons: a) the iteration history showed convergence at 0 after only 3 iterations; b) the

clusters were roughly equal in terms of size; and c) ANOVA results showed that all three perspectives had a significant impact on determining which cluster teachers were grouped into (p <.001) (Table 8).

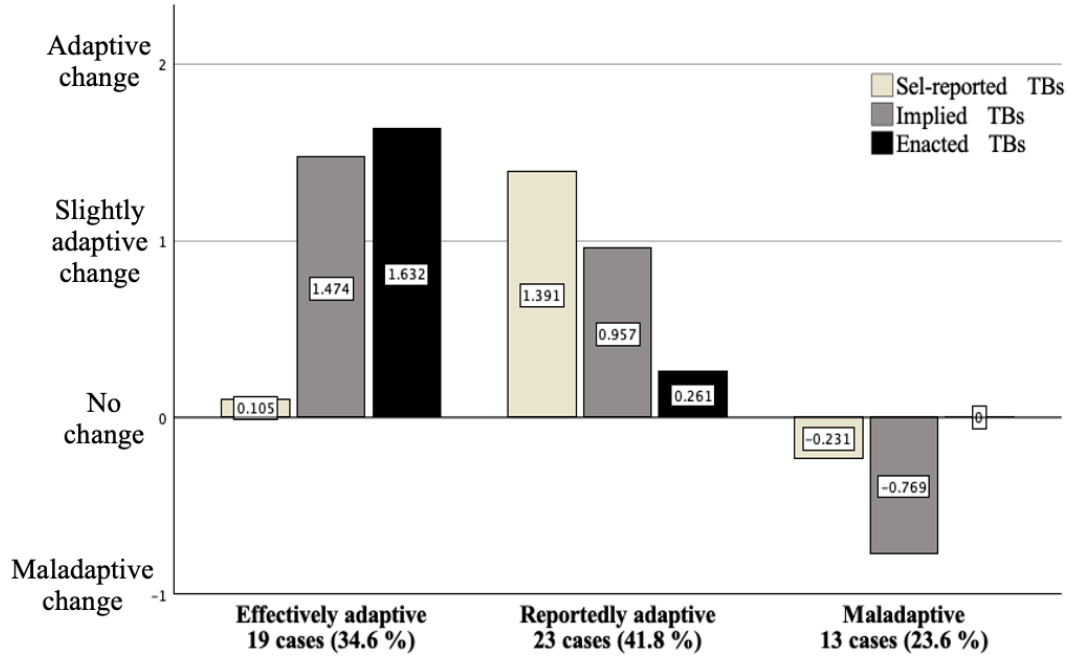


Figure 24: profiles of teachers according to the evolution of their TBs

Table 8: ANOVA table for the 3-cluster solution

	Cluster		Error			
	Mean Square	df	Mean Square	df	F	Sig.
Self-reported TBs	13.976	2	.569	52	24.573	<.001
Implied TBs	20.454	2	.615	52	33.237	<.001
Enacted TBs	13.627	2	.440	52	31.002	<.001

Table 9 presents the mean and the standard deviation of every TB perspective by cluster. A comparison using Bonferroni´s test showed that these means were significantly different (p = <.001) across clusters except in self-reported TBs between effectively adaptive and maladaptive profiles (p = .664), in implied TBs between effectively adaptive and reportedly adaptive profiles (p = .115), and in enacted TBs between reportedly adaptive and maladaptive (p = .786). This three-cluster solution was not only the most robust and statistically significant, but also the most informative and enlightening to understand how TBs evolved across 2 academic years.

Table 9: M and SD of belief perspectives by cluster

	N	%	Belief perspective	M	SD
Effectively adaptive profile	19	34.6%	Sel-reported TBs	0.11	0.809
			Implied TBs	1.47	0.513
			Enacted TBs	1.63	0.684
Reportedly adaptive profile	23	41.8%	Sel-reported TBs	1.39	0.722
			Implied TBs	0.96	1.022
			Enacted TBs	0.26	0.689
Maldaptive profile	13	23.6%	Sel-reported TBs	-0.23	0.725
			Implied TBs	-0.77	0.599
			Enacted TBs	0.00	0.577

Effectively adaptive profile: the means shown in Table 10 suggest that the 34.6% of participants reported virtually no change in their TBs, but the TBs implied in their comments and enacted in their lesson plans evolved adaptively, particularly the latter. A closer analysis shows that the level of the constructivist orientation in the TBs reported by them through the baseline questionnaire ($\overline{X} = 5.67$) was higher than that reported by the rest of participants, which suggest that these teachers had already a high level of constructivist TBs before the CPD programme, but their teaching practice was still traditional because they did not know how to enact these beliefs in practice. The CPD programme provided them with an operational constructivist methodology which was experienced very positively and seen as very advantageous, helping them to transform the TBs actually informing their lesson plans in a consistent way throughout 2 academic years with the prospect of extending its implementation.

Reportedly adaptive profile: the means suggest that 41.8% of teachers did report adaptive change in their TBs, but this change was only slightly adaptive in the TBs implied in their comments and very slightly or virtually non-existent in the TBs enacted in their lesson plans. Interestingly, the level of their constructivist orientation in the baseline questionnaire ($\overline{X} = 5.11$) was 9.3% lower than that of those in the effectively adaptive profile. These teachers found the constructivist methodology very innovative and experienced it positively with more pros than cons, which led them to change their

self-reported TBs significantly. However, they did not succeed in translating this change into practice when designing their lesson plans, as if change in self-reported and implied TBs did not necessarily lead to change in enacted TBs or required more than 2 academic years to do so.

Maladaptive profile: the means suggests that 23.6% of teachers reported slightly maladaptive change in their TBs, implied maladaptive change in their comments and did not change the TBs enacted in their lesson plans at all. Interestingly and in contrast to the teachers of the other two profiles, who designed and piloted the 88.4% of the TBL lesson plans expected during the CPD programme, the 13 teachers included in this profile submitted and piloted only the 48,7% of them. Some of them disengaged from the two-year online mentoring just after the initial, in-person training, and the rest did so after year 1. The former did not commit to the CPD programme or just opposed to it, and the latter experienced the process of designing and piloting TBL lesson plans negatively, as if their participation had reinforced a preexisting resistance to the intended educational change.

5.7.2 Association of demographic variables with profiles

While the findings did not suggest a significant association of the evolution of TBs with gender or discipline, they did so concerning type of schooling and teaching experience. Table 10 shows that, although the mean of the baseline constructivist orientation in baccalaureate teachers ($\bar{X}$=5.51) was virtually the same as that in vocational education teachers ($\bar{X}$=5.56), the proportion of teachers in the effectively adaptive profile was more than twice as high in the latter than in the former. It also shows that, while the proportion of teachers belonging to the effectively adaptive profile is virtually the same across all career stages, the more teaching experience, the higher reportedly adaptive and the lower maladaptive change in TBs.

Table 10: teachers across profiles according to type of schooling and career stage

			Schooling type				**Career stage**					
	Whole sample		Vocational education		Baccalaureate		1-6 years		7-18 years		>18 years	
Profiles	n	%	n	%	n	%	n	%	n	%	n	%
Effectively adaptive	19	34.5	13	28.3	6	66.7	4	36.4	8	34.8	7	33.3
Reportedly adaptive	23	41.8	21	45.7	2	22.2	3	27.3	10	43.5	10	47.6
Maladaptive	13	23.6	12	26.1	1	11.1	4	36.4	5	21.7	4	19.0

5.8 Discussion

This study aimed at understanding the evolution of teachers' TBs in response to sustained, in-service teacher education might contribute valuable knowledge both in methodological and empirical terms. Methodologically, it explores an approach which is innovative in research into belief development and could enrich our understanding of the transformative potential of CPD in two ways. Firstly, the adoption of (de Vries et al., 2013, 2014) two-dimensional conceptualisation of TBs allows to interpret professional development initiatives as an effort to complement rather than to replace different teaching approaches. In other words, the educational change driven by CPD can be understood as a process of professional growth which does not necessarily entail abandoning original beliefs but reshaping the balance between 2 belief dimensions differently. In this sense, a combination that "score[s] high on both scales [dimensions]" would be particularly desirable, as "teachers should master teaching skills associated with both constructivist models and practices and more traditional approaches" (de Vries et al., 2014, p. 340; also Kyriakides et al., 2009; Lipowsky et al., 2009). Moreover, the combination of a person- rather than variable-centred perspective and Day's et al. (2008) synergetic approach allows to uncover possible patterns or profiles of teachers. The notion of profiles has already been used within the field of teachers' beliefs (de Vries et al., 2013), but only from a cross-sectional approach. In our view, capturing the heterogeneity of teachers' response to CPD in profiles according to the evolution of their TBs from different perspectives might well be a suitable way to explore the transformative nature of in-service teacher education and to enhance our understanding of whether and how professional development does or does not take place.

Empirically, the findings should be taken with all due caution. Teachers' actual TBs are subjective by nature, will always remain personal and private, and can only be indirectly inferred. Moreover, different leadership styles of headteachers might have impacted participants' commitment to, and performance during, the CPD programme (e.g., Day, 1999). It was not in our hands to discriminate how far this led to performative responses without actual belief change, particularly when considering the number of lesson plans submitted.

The findings suggest that TBs are multifaceted and evolve differently from different perspectives in response to CPD, pointing to the existence of three profiles of teachers. One-third of teachers succeeded in driving the intended change in TBs when planning lessons in a sustained way (effectively adaptive profile), although we do not know how far this change was ultimately driven when implementing these plans in the classroom. The other two thirds of teachers whether embraced the intended TBs but did not enact them in their lesson plans (reportedly adaptive profile) or opposed them (maladaptive profile), despite the programme ticking all the boxes of effective CPD. The teachers belonging to the reportedly adaptive profile were very likely to have developed the conditions to move to the effectively adaptive one in further stages of the programme, but this progression across profiles would require further research. In any case, the identification of these three profiles suggests that the group of potential participants selected by headteachers for the CPD programme did not actually represent the 'early majority', but rather the whole spectrum of attitudes towards innovation.

The findings also imply the possible occurrence of three factors influencing the evolution of TBs that could deserve further research. Firstly, they align with scholars contending that the enaction of new TBs is more likely to occur in teachers whose constructivist orientation is predominant (e.g., Choi et al., 2023), thus suggesting that prior TBs can act as filters for the effectiveness of CPD (Kagan, 1992; Levin, 2015; Nespor, 1987; Pajares, 1992; Valckx et al., 2021). Secondly, in showing a degree of inconsistency between the change in TBs reported and enacted by teachers, they align with research emphasising the discrepancy between reported and enacted beliefs (Kaymakamoglu, 2017; Kane et al., 2002; Lane & Ní Ríordáin, 2020; Onurkan & Özer, 2017; Tang et al., 2012) and support scholars contending that this discrepancy might be a piece of evidence of belief development (e.g., Buehl & Beck, 2015). In this sense, the findings provide a more nuanced understanding of the complexity of change in TBs and thus of effective CPD. Indeed, they show how this discrepancy starts when teachers enact their TBs when planning lessons before classroom practices, thus suggesting that the loss of change effectiveness of CPD already happens in teachers' pre-class action. The reportedly adaptive profile suggests that almost half of teachers failed to enact in their lesson plans the change in

TBs that they professed to have experienced. This finding is new within the field of teachers' beliefs and supports the particular suitability of CPD approaches highlighting the importance of the lesson planning phase of teaching such as Instructional coaching (e.g., Knight, 2017) and Lesson Study (e.g., Bucher *et al*., 2026).

Finally, the findings suggests that the evolution of TBs in response to CPD might have some association with demographic variables (e.g., Chant, 2009). The degree of association found in the reportedly adaptive and maladaptive profiles with teaching experience might well be a valuable piece of evidence addressing "the need to confirm" how far "the observation of more student-centred beliefs expressed by experienced teachers is a developmental pattern" (Levin, 2015, p. 58). In this sense, it is consistent with Arancibia's et al. (2020a, p. 25) finding that teachers' "behavioural beliefs diminish as their teaching experience increases", and it questions that TBs become more and more robust "over time and use" (de Vries et al., 2014, p. 339; after Murphy & Mason, 2006; Pajares, 1992) due to the development of "actual routines" or "inertia" (Tang et al., 2012, p. 104). In contrast, the lack of association between the discipline taught by teachers and the three profiles suggest that, while TBs "may differ with regard to different knowledge domains" Levin (2015, p. 58), their evolution in response to CPD appears to be similar.

5.9 Implications for policy, practice, and future research

In terms of policy, we recommend administrators and policymakers including the evolution of TBs as an essential aspect in both the development and evaluation of professional development. The profiles found in the study suggest that focusing on the development of TBs led to a consistent, sustainable transformation of the ways in which one third of participants actually approached their classroom teaching practice in response to the CPD programme. They also suggest that another third of teachers realised the advantages entailed by the change intended, which seems a necessary step to avoid falling into "solutionitis" for pressuring teachers to implement the legal reform without "fully understanding the exact problem to be solved [the intended change]" (Bryk, 2015, p. 468). We also urge education authorities within contexts of reform to seize opportunities to promote and harness non-official educational change initiatives that could emerge in local contexts or in institutions such as that

addressed by this study. In the case of countries such as Spain, where educational reforms are not accompanied by the necessary teacher education support and teachers feel unattended when it comes to realising the intended change in the classroom (e.g., Prats et al., 2019), this recommendation seems particularly pertinent. Finally, we encourage administrators and policymakers to seriously consider the suitability of training, qualifying, and supporting teacher educators to engage in high-quality research. This study suggests that practitioners can account for an unparalleled perspective on educational change, not only for the particularly rich variety of data that they can access, but also because CPD programmes are the optimal instance for longitudinal studies on the evolution of teaching beliefs (Buehl & Beck, 2015). In this sense, and in the line of thought delineated by some scholars (Cochran-Smith, 2005; Oancea & Furlong, 2007; Wise et al., 2018), this piece of practitioner research provides "practice-based evidence as an essential complement to findings from other forms of educational research" (Bryk, 2015, p. 475).

In terms of research, this study represents a new approach to understanding the transformative power of CPD that is worth further exploring. We propose to do so by addressing some of its limitations. Firstly, the profiles found in it might well be context-dependant, and replications where the researcher's position could minimise the existence of possible vested interests in the findings would be welcome. Secondly, the analysis of change in the 3 perspectives on TBs addressed in it is highly interpretive, and further refinement of the coding frameworks developed to uncover their evolution seems appropriate. Thirdly, studies adopting a multifaceted perspective on TBs that explore their enaction both in classroom teaching practices and in the design of the lesson plans would enhance our understanding of the transformative potential of CPD, allowing to examine in more detail when and how the loss of change effectiveness occurs. Fourthly, the profiles found provide an initial understanding of the evolution of TBs in response to CPD, but further research is needed to explore the factors influencing this evolution and their underlying dynamics facilitating or hampering the intended change in TBs, such as type of schooling (e.g., baccalaureate and vocational education teachers). Fifthly, the study covers the evolution of TBs in response to a two-year CPD programme during the programme itself, and the changes uncovered might point to sustainable change but also to

situational variations rather than actual, sustained development. In this sense, studies addressing the evolution of TBs once CPD programmes have finished are needed. Finally, studies addressing longer programmes would allow to explore how far teachers can move from the reportedly to the effectively adaptive profile and thus to evaluate how far the discrepancy between reported and enacted TBs is a sign of belief change.

In terms of practice, we firstly recommend teacher educators and promoters of CPD designing initiatives focused on having teachers pilot transformational methodologies that provide them with manageable, really operational procedures such as TBL, and then reflect on their experience. The findings suggest that disruptive methodologies such as TBL might well be a suitable driver for educational change in different school and educational contexts, not only in Spain. Secondly, we suggest teacher educators consider targeted CPD programmes drawing on the profiles found in this study. Particularly, when designing programmes aimed at driving change towards constructivist practices, we recommend considering the recruitment of participants according to type of schooling, as vocational education and baccalaureate teachers appear to respond differently to CPD. Finally, given the discrepancy found between the change in TBs professed by teachers and that enacted in the lesson planning phase of teaching, we urge teacher educators and institutions interested in promoting educational change through CPD to pay special attention to the lesson plan phase guiding classroom practices, mentoring teachers to minimise the loss of change effectiveness before classroom practices.

5.10 References

Alger, C. L. (2009). Secondary teachers' conceptual metaphors of teaching and learning: Changes over the career span. *Teaching and Teacher Education*, *25*(5), 743–751. https://doi.org/10.1016/j.tate.2008.10.004

Ammon, P., & Levin, B. B. (1993). Expertise in teaching from a developmental perspective: The developmental teacher education program at Berkeley. *Learning and Individual Differences*, *5*(4), 319–326. https://doi.org/10.1016/1041-6080(93)90015-K

Anney, V. N. (2015). Ensuring the Quality of the Findings of Qualitative Research: Looking at Trustworthiness Criteria. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS)*, *5*(2), 272–281.

Arancibia, M. L., Cabero, J., & Marín, V. (2020a). Análisis factorial de una escala de creencias sobre la enseñanza y su relación con características personales y profesionales de docentes de Educación Superior. *Revista Espacios*, *41*, 25–31. https://es.revistaespacios.com/a20v41n02/20410225.html

Arancibia, M. L., Cabero, J., & Marín, V. (2020b). Creencias sobre la enseñanza y uso de las tecnologías de la información y la comunicación (TIC) en docentes de educación superior. *Formación Universitaria*, *13*(3), 89–100. https://doi.org/10.4067/s0718-50062020000300089

Ashton, P., & Gregoire-Gill, M. (2003). At the Heart of Teaching. The Role of Emotion in Changing Teachers' Beliefs. In J. Raths & A. McAninch (Eds.), *Teacher Beliefs and Classroom Performance: The Impact of Teacher Education* (pp. 99–122). Information Age.

Ashton, P. T. (2015). Historical overview and theoretical perspectives of research on teachers' beliefs. In H. Fives & M. G. Gill (Eds.), International *Handbook of Research on Teachers' Beliefs* (pp. 31–47). Routledge.

Bächler, R., Pozo, J., & Scheuer, N. (2018). How do teachers conceive the role of emotions in teaching and learning ? An analysis of the affective component of their beliefs. *Infancia y Aprendizaje*, *41*(4), 733–793. https://doi.org/10.1080/02103702.2018.1518078

Barcelos, A. M. F. (2024). The relationship between beliefs and practice in language teaching education. *Educational Role of Language Journal*, *2024–1*(11), 93–104. https://doi.org/10.36534/erlj.2024.01.08

Basturkmen, H. (2012). Review of research into the correspondence between language teachers' stated beliefs and practices. *System*, *40*(2), 282–295. https://doi.org/10.1016/j.system.2012.05.001

Beswick, K. (2005). The beliefs/practice connection in broadly defined contexts. *Mathematics Education Research Journal*, *17*(2), 39–68. https://doi.org/10.1007/BF03217415

Bolhuis, S. M. (2000). Naar zelfstandig leren: wat doen en denken docenten? Leuven: Garant: Antwerpen

Borg, M. (2001). Teachers' beliefs. *ELT Journal*, *55*(2), 186–188. https://doi.org/10.1515/9783110197372

Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher*, *33*(8), 3–15. https://doi.org/10.3102/0013189X033008003

Broughton, S. H., Sinatra, G. M., & Nussbaum, E. M. (2013). "Pluto Has Been a Planet My Whole Life!" Emotions, Attitudes, and Conceptual Change in Elementary Students' Learning about Pluto's Reclassification. *Research in Science Education*, *43*(2), 529–550. https://doi.org/10.1007/s11165-011-9274-x

Bryk, A. S. (2015). 2014 AERA Distinguished Lecture: Accelerating How We Learn to Improve. *Educational Researcher*, *44*(9), 467–477. https://doi.org/10.3102/0013189X15621543

Bucher, J., Kager, K., Kim, J., & Vock, M. (2026). Lesson Study in its original context: exploring Japanese teachers' perspectives on an export hit of the Japanese education system. *Professional Development in Education*. https://doi.org/10.1080/19415257.2026.2682240

Buehl, Mi., & Beck, J. (2015). The relationship between teachers' beliefs and teachers' practices. In H. Fives & M. Gill (Eds.), *International Handbook of Research on Teachers' Beliefs* (pp. 66-84). Routledge.

Caleon, I. S., Tan, Y. S. M., & Cho, Y. H. (2018). Does Teaching Experience Matter? The Beliefs and Practices of Beginning and Experienced Physics Teachers. *Research in Science Education*, *48*(1), 117–149. https://doi.org/10.1007/s11165-016-9562-6

Castro Superfine, A., Goldman, S., & Ko, M.-L. M. (2022) (Eds.). *Teacher Learning in Changing Contexts. Perspectives from the Learning Science*. Routledge. https://doi.org/https://doi.org/10.4324/9781003097112

Chant, R. H. (2009). *Developing Involved and Active Citizens: The Role of Personal Practical Theories and Action Research in a Standards-Based Social Studies Classroom*. *36*(1), 181–190. http://www.jstor.org/stable/23479208

Cheng, M. M. H., Chan, K. W., Tang, S. Y. F., & Cheng, A. Y. N. (2009). Pre-service teacher education students' epistemological beliefs and their conceptions of teaching. *Teaching and Teacher Education*, *25*(2), 319–327. https://doi.org/10.1016/j.tate.2008.09.018

Cheung, A., & Hennebry-Leung, M. (2020). Exploring an ESL teachers' beliefs and practices of teaching literary texts: A case study in Hong Kong. *Language Teaching Research*. https://doi.org/10.1177/1362168820933447

Choi, S., Jang, Y., & Kim, H. (2023). Influence of Pedagogical Beliefs and Perceived Trust on Teachers' Acceptance of Educational Artificial Intelligence Tools. *International Journal of Human-Computer Interaction*, *39*(4), 910–922. https://doi.org/10.1080/10447318.2022.2049145

Clarke, D., & Hollingsworth, H. (2002). Elaborating a model of teacher professional growth. *Teaching and Teacher Education*, *18*(8), 947–967. https://doi.org/10.1016/S0742-051X(02)00053-7

Cochran-Smith, M. (2005). Teacher educators as researchers: Multiple perspectives. *Teaching and Teacher Education*, *21*(2), 219–225. https://doi.org/10.1016/j.tate.2004.12.003

Cochran-Smith, M., Baker, M., Burton, S., Chang, W. C., Cummings Carney, M., Fernández, M. B., Stringer Keefe, E., Miller, A. F., & Sánchez, J. G. (2017). The accountability era in US teacher education: looking back, looking forward. *European Journal of Teacher Education*, *40*(5), 572–588. https://doi.org/10.1080/02619768.2017.1385061

Corbin, J. M., & Strauss, A. L. (2015). *Basics of qualitative research: techniques and procedures for developing grounded theory* (4th ed.). SAGE.

Cuban, L. (2013). *Inside the Black Box of Classroom Practice: Change without Reform in American Education.* Harvard Education Press.

Dang, T. V. A., Haworth, P., & Ashton, K. (2024). Pre-service teachers' belief changes in an English for specific purposes teacher education context. *English for Specific Purposes*, *73*, 110–123. https://doi.org/10.1016/j.esp.2023.10.009

Day, C. (1999). *Developing Teachers: The Challenges of Lifelong Learning*. London: Falmer Press.

Day, C., Sammons, P., & Gu, Q. (2008). Combining Qualitative and Quantitative Methodologies in Research on Teachers' Lives, Work, and Effectiveness: From Integration to Synergy. *Educational Researcher*, *37*(6), 330–342. https://doi.org/10.3102/0013189x08324091

Darling-Hammond, L., Hyler, M.E., & Gardner, M. (2017). Effective Teacher Professional Development. *Learning policy institute*. Retrieved from https://learningpolicyinstitute.org/product/effective-teacher-professional-development-report [Accessed 23 March 2022]

De Vaus, D. (2014). *Surveys in social research* (6th ed.). Routledge.

de Vries, S., Jansen, E. P. W. A., & van de Grift, W. J. C. M. (2013). Profiling teachers' continuing professional development and the relation with their beliefs about learning and teaching. *Teaching and Teacher Education*, *33*, 78–89. https://doi.org/10.1016/j.tate.2013.02.006

de Vries, S., Van De Grift, W. J. C. M., & Jansen, E. P. W. A. (2014). How teachers´ beliefs about learning and teaching relate to their continuing professional development. *Teachers and Teaching: Theory and Practice*, *20*(3), 338–357. https://doi.org/10.1080/13540602.2013.848521

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher*, *38*(3), 181–199. https://doi.org/10.3102/0013189X08331140

Egloff, F., & Souvignier, E. (2020). Effects of Emotion on Teaching-Related Beliefs, Attitudes, and Intentions of Preservice Teachers. *Psychology Learning and Teaching*, *19*(2), 161–183. https://doi.org/10.1177/1475725719868410

Elliott, V. (2018). Thinking about the coding process in qualitative data analysis. *Qualitative Report*, *23*(11), 2850–2861. https://doi.org/10.46743/2160-3715/2018.3560

Erduran, S., & Kaya, E. (2018). Drawing Nature of Science in Pre-service Science Teacher Education: Epistemic Insight Through Visual Representations. *Research in Science Education*, *48*(6), 1133–1149. https://doi.org/10.1007/s11165-018-9773-0

Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers and Education*, *59*(2), 423–435. https://doi.org/10.1016/j.compedu.2012.02.001

Ertmer, P. A., Ottenbreit-Leftwich, A. T., & Tondeur, J. (2015). Teachers' beliefs and uses of technology to support 21st-century teaching and learning. In H. Fives & M. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 403–418). Routledge.

Estis, J. M. (2017). Changing Culture through Active Learning. In R. A. Styron & J. L. Styron (Eds.), *Comprehensive Problem-Solving and Skill Development for Next-Generation Leaders* (pp. 96–115). IGI Global. https://doi.org/10.4018/978-1-5225-1968-3.ch005

Fairman, J. C., Smith, D. J., Pullen, P. C., & Lebel, S. J. (2023). The challenge of keeping teacher professional development relevant. *Professional Development in Education*, *49*(2), 197–209. https://doi.org/10.1080/19415257.2020.1827010

Fatmi, M., Hartling, L., Hillier, T., Campbell, S., & Oswald, A. E. (2013). The effectiveness of team-based learning on learning outcomes in health professions education: BEME Guide No. 30. *Medical Teacher*, *35*(12), e1608-24. https://doi.org/10.3109/0142159X.2013.849802.

Fives, H., Barnes, N., Chiavola, C., SaizdeLaMora, K., Oliveros, E., & Mabrouk-Hattab, S. (2019). *Reviews of Teachers' Beliefs*. *May*, 1–18. https://doi.org/https://doi.org/10.1093/acrefore/9780190264093.013.781

Fives, H., & Buehl, M. (2012). Spring cleaning for the "messy" construct of teachers' beliefs: What are they? Which have been examined? What can they tell us? *APA Educational Psychology Handbook, Vol 2: Individual Differences and Cultural and Contextual Factors.*, *2*, 471–499. https://doi.org/10.1037/13274-019

Fives, H., & Gill, M. (2015) (Eds.). *International handbook of research on teachers' beliefs*. Routledge.

Frijda, N. H., & Mesquita, B. (2000). Beliefs through emotions. In N. H. Frijda, A. S. R. Manstead, & Sacha Bem (Eds.), *Emotions and beliefs: How feelings influence thoughts* (pp. 45–77). Cambridge University Press Cambridge, UK.

Fullan, M. (2015). *The New Meaning of Educational Change* (5th ed.). Teachers College Press.

Gao, Y., & Zhou, Y. (2021). Exploring Language Teachers' Beliefs About the Medium of Instruction and Actual Practices Using Complex Dynamic System Theory [Article]. *Frontiers in Education (Lausanne)*, *6*. https://doi.org/10.3389/feduc.2021.708031

Gibbons, R. E., Villafañe, S. M., Stains, M., Murphy, K. L., & Raker, J. R. (2018). Beliefs about learning and enacted instructional practices: An investigation in postsecondary chemistry education. *Journal of Research in Science Teaching*, *55*(8), 1111–1133. https://doi.org/10.1002/tea.21444

Gill, M. G., Ashton, P. T., & Algina, J. (2004). Changing preservice teachers' epistemological beliefs about teaching and learning in mathematics: An intervention study. *Contemporary Educational Psychology*, *29*(2), 164–185. https://doi.org/10.1016/j.cedpsych.2004.01.003

Gill, M., & Hardin, C. (2015). A "hot" mess: Unpacking the relation between teachers' beliefs and emotions. In H. Fives & M. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 230–246). Routledge.

Girardet, C. (2018). Why do some teachers change and others don't? A review of studies about factors influencing in-service and pre-service teachers' change in classroom management. *Review of Education*, *6*(1), 3–36. https://doi.org/10.1002/rev3.3104

Goodnough, K. (2008). Moving science off the "Back Burner": Meaning making within an action research community of practice. *Journal of Science Teacher Education*, *19*(1), 15–39. https://doi.org/10.1007/s10972-007-9077-0

Goodson, I. F. (2001). Social Histories of Educational Change. *Journal of Educational Change*, *2*(1981), 45–63. https://doi.org/10.1023/A:1011508128957

Gregoire, M. (2003). Is It a Challenge or a Threat? A Dual-Process Model of Teachers' Cognition and Appraisal Processes during Conceptual Change. *Educational Psychology Review*, *15*(2), 147–179. https://doi.org/10.1023/A:1023477131081

Guskey, T. R. (2002). Professional development and teacher change. *Teachers and Teaching: Theory and Practice*, *8*(3), 381–391. https://doi.org/10.1080/135406002100000512

Haidet, P ; Kubitz, K; McCormack, W. (2014). Analysis of the Team-Based Learning Literature: TBL comes to Age. *J Excell Coll Teach*, *25*(3–4), 303–333. https://doi.org/10.1038/nbt.3121.ChIP-nexus.

Hancock, E. S., & Gallard, A. J. (2004). Preservice science teachers' beliefs about teaching and learning: The influence of K-12 field experiences. *Journal of Science Teacher Education*, *15*(4), 281–291. https://doi.org/10.1023/B:JSTE.0000048331.17407.f5

Hargreaves, A. (2000). Four ages of professionalism and professional learning. *Teachers and Teaching: Theory and Practice*, *6*(2), 151–182. https://doi.org/10.1080/713698714

Hoffman, B. H., & Seidel, K. (2015). Measuring Teachers' Beliefs: For What Purpose? In H. Fives & M. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 106–127). Routledge.

Hrynchak, P., & Batty, H. (2012). The educational theory basis of team-based learning. *Medical Teacher*, *34*(10), 796–801. https://doi.org/10.3109/0142159X.2012.687120

Huberman, M. (1992). Understanding teacher development. In A. Hargreaves & M. G. Fullan (Eds.), *Teacher development and instructional mastery* (pp. 122–142). Cassell.

Inan, F. A., & Bolliger, D. U. (2024). Online instructors' pedagogical beliefs and choice of student learning activities. *Educational Technology Research and Development*, *72*(2), 727–746. https://doi.org/10.1007/s11423-023-10331-z

Kagan, D. (1992). Implications of Research on Teacher Belief. *Educational Psychologist*, *27*(1), 65–90. https://doi.org/10.1207/s15326985ep2701_6

Kane, R., Sandretto, S., & Heath, C. (2002). Telling half the story: A critical review of research on the teaching beliefs and practices of university academics. *Review of educational research*, *72*(2), 177-228. https://doi.org/10.3102/00346543072002177

Kaymakamoglu, S. E. (2017). Teachers' Beliefs, Perceived Practice and Actual Classroom Practice in Relation to Traditional (Teacher-Centered) and Constructivist (Learner-Centered) Teaching (Note 1). *Journal of Education and Learning*, *7*(1), 29–37. https://doi.org/10.5539/jel.v7n1p29

King, F., & Stevenson, H. (2017). Generating change from below: what role for leadership from above? *Journal of Educational Administration*, *55*, 657–670. https://doi.org/10.1108/JEA-07-2016-0074

Kelchtermans, G. (2008). Narratief weten, zelfverstaan en kwetsbaarheid [Narrative knowing, self-comprehension and vulnerability]. In L. Stevens (Ed.), *eraar, wie ben je? [Teacher, who are you?]* (pp. 13–21). Garant: Antwerpen

Klieme, E., & Vieluf, S. (2009). Teaching practices, teachers' beliefs and attitudes. In *Creating Effective Teaching and Learning Environments: First Result s from TALIS* (pp. 87–124). OECD Publishing.

Knight, J. (2017). *The impact cycle: What instructional coaches should do to foster powerful improvements in teaching*. Thousand Oaks: Corwin Press.

Kotter, J. P. (2012). *Leading change*. Harvard business press.

Krosnick, J. A., & Presser, S. (2010). Question and questionnaire design. In P. V. Marsden & J. V. Wright (Eds.), *Handbook of Survey Design* (pp. 263–313). Emerald Group Publishing Ltd.

Kubitz, K. (2014). The evidence, Please. In J. Sibley & P. Ostafichuk (Eds.), *Getting started with team-based learning* (pp. 45-62). Stylus Publishing.

Kyriakides, L., Creemers, B. P. M., & Antoniou, P. (2009). Teacher behaviour and student outcomes: Suggestions for research on teacher training and professional development. *Teaching and Teacher Education*, *25*(1), 12–23. https://doi.org/10.1016/j.tate.2008.06.001

Lane, C., & Ní Ríordáin, M. (2020). Out-of-Field Mathematics Teachers' Beliefs and Practices: an Examination of Change and Tensions Using Zone Theory. *International Journal of Science and Mathematics Education*, *18*(2), 337–355. https://doi.org/10.1007/s10763-019-09964-5

Langelaan, B. N., Gaikhorst, L., Smets, W., & Oostdam, R. J. (2024). Differentiating instruction: Understanding the key elements for successful teacher preparation and development. In *Teaching and Teacher Education* (Vol. 140). Elsevier Ltd. https://doi.org/10.1016/j.tate.2023.104464

Lee, J. C. K., & Yin, H. B. (2011). Teachers' emotions and professional identity in curriculum reform: A Chinese perspective. *Journal of Educational Change*, *12*(1), 25–46. https://doi.org/10.1007/s10833-010-9149-3

Levin, B. (2015). The development of teachers' beliefs. In H. Fives & M. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 48–65). Routledge.

Levin, T., & Wadmany, R. (2006). Teachers' beliefs and practices in technology-based classrooms: A developmental view. *Journal of Research on Technology in Education*, *39*(2), 157–181. https://doi.org/10.1080/15391523.2006.10782478

Lincoln, Y. S., & Guba, E. G. (1986). But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Program Evaluation*, *1986*(30), 73–84. https://doi.org/10.1002/ev.1427

Lipowsky, F., Rakoczy, K., Pauli, C., Drollinger-Vetter, B., Klieme, E., & Reusser, K. (2009). Quality of geometry instruction and its short-term impact on students' understanding of the Pythagorean Theorem. *Learning and Instruction*, *19*(6), 527–537. https://doi.org/10.1016/j.learninstruc.2008.11.001

Litman, T. (2006). *Planning principles and practices*. Victoria Transport Policy Institute.

Liu, S. H. (2011). Factors related to pedagogical beliefs of teachers and technology integration. *Computers and Education*, *56*(4), 1012–1022. https://doi.org/10.1016/j.compedu.2010.12.001

López Rupérez, F. (2022). El enfoque del currículo por competencias. Un análisis de la LOMLOE. *Revista Española de Pedagogía*, *80*(281). https://doi.org/10.22550/rep80-1-2022-05

Louis, K. S. (2007). Trust and improvement in schools. *Journal of Educational Change*, *8*(1), 1–24. https://doi.org/10.1007/s10833-006-9015-5

Maul, A., Torres Irribarra, D., & Wilson, M. (2016). On the philosophical foundations of psychological measurement. *Measurement: Journal of the International Measurement Confederation*, *79*, 311–320. https://doi.org/10.1016/j.measurement.2015.11.001

Mayer, D., Dixon, M., Kline, J., Kostogriz, A., Moss, J., Rowan, L., Walker-Gibbs, B., & White, S. (2017). Studying the Effectiveness of Teacher Education: Early Career Teachers in Diverse Settings. *Studying the Effectiveness of Teacher Education: Early Career Teachers in Diverse Settings*, 1–136. https://doi.org/10.1007/978-981-10-3929-4

Mayer, D., & Oancea, A. (2021). Teacher education research, policy and practice: finding future research directions. *Oxford Review of Education*, *47*(1), 1–7. https://doi.org/10.1080/03054985.2021.1853934

Mazhar, S., Kazmi, A., Yousaf, A., & Habib, R. (2021). Exploring the Relationship between Instructional Practice and Pedagogic Beliefs of University Teachers. *VFAST Transactions on Education and Social SciencesVTESS@*, *2021*(1), 122–132. http://vfast.org/journals/index.php/

Meirink, J. A., Meijer, P. C., Verloop, N., & Bergen, T. C. M. (2009). Understanding teacher learning in secondary education: The relations of teacher activities to changed beliefs about teaching and learning. *Teaching and Teacher Education*, *25*(1), 89–100. https://doi.org/10.1016/j.tate.2008.07.003

Merchie, E., Tuytens, M., Devos, G., & Vanderlinde, R. (2018). Evaluating teachers' professional development initiatives: towards an extended evaluative framework. In *Research Papers in Education* (Vol. 33, Issue 2, pp. 143–168). Routledge. https://doi.org/10.1080/02671522.2016.1271003

Michaelsen, L. K., & Sweet, M. (2011). Team-based learning. *New Directions for Teaching and Learning*, *2011*(128), 41–51. https://doi.org/10.1002/tl.467.

Michaelsen, L. K., Sweet, M., & Parmelee, D. X. (Eds.) (2011). *Team-Based Learning: Small Group Learning's Next Big Step: New Directions for Teaching and Learning, Number 116* (103). San Francisco: John Wiley & Sons.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2020). *Qualitative data analysis: a methods sourcebook* (Fourth). Thousand Oaks, CA: Sage.

Mladenovici, V., Crașovan, M., & Ilie, M. D. (2024). Towards a Consensus: Harmonizing Definitions and Consistency in Terminology Use of Conceptions of Teaching in Higher Education. A Systematic Literature Review [Article]. *Revista de Ştiinţe Ale Educaţiei*, *49*(1), 4–32. https://doi.org/10.35923/JES.2024.1.01

Monarca, H., & Rappoport, S. (2013). Investigación sobre los procesos de cambio: El caso de las competencias básicas en España. *Revista de Educación*, 54–78. https://doi.org/10.4438/1988-592X-RE-2013-EXT-256

Murphy, P. K., & Mason, L. (2006). Changing knowledge and beliefs. In P.Alexander & P. Winne (Eds.), *Handbook of Educational Psychology* (pp. 305–324). London: Lawrence Erlbaum Associates Publishers.

Nespor, J. (1987). The role of beliefs in the practice of teaching. *Journal of Curriculum Studies*, 19(4), 317–328. https://doi.org/10.1080/0022027870190403

Nelson, M., & Tweddell, S. (2017). Leading academic change: experiences of academic staff implementing team-based learning. *Student Engagement in Higher Education Journal*, *1*(2), 100–116. https://doi.org/10.1093/bjsw/bcs140.

Oancea, A., & Furlong, J. (2007). Expressions of excellence and the assessment of applied and practice-based research. *Research Papers in Education*, *22*(2), 119–137. https://doi.org/10.1080/02671520701296056

Onurkan, G., & Özer, B. (2017). Student-centred learning (SCL): roles changed? *Teachers and Teaching: Theory and Practice*, *23*(4), 422–435. https://doi.org/10.1080/13540602.2016.1205014

OECD. (2009). *Creating effective teaching and learning environments: First results from TALIS.* Paris: Organisation for Economic Co-operation and Development.

OECD. (2010). TALIS 2008 Technical Report. *Oecd*. Retrieved from http://www.oecd.org/dataoecd/16/14/44978960.pdf%5Cnpapers2://publication/uuid/AF9D96CC-35F2-421C-9FBF-D34F620B9AAC [Accessed 21 April 2021].

OECD. (2014). *TALIS 2013 Results*. Retrieved from http://www.oecd-ilibrary.org/education/talis-2013-results/developing-and-supporting-teachers_9789264196261-7-en [Accessed 3 August 2021].

OECD. (2019). *TALIS 2018 Techincal Report*. Retrieved from http://www.oecd.org/education/talis/TALIS_2018_ Technical_Report.pdf [Accessed 15 March 2021].

Ogan-Bekiroglu, F., & Akkoç, H. (2009). Preservice teachers' instructional beliefs and examination of consistency between beliefs and practices. *International Journal of Science and Mathematics Education*, *7*(6), 1173–1199. https://doi.org/10.1007/s10763-009-9157-z

Olafson, L., Salinas, C., & Owens, M. (2015). Qualitative Approaches to Studying Teachers' Beliefs. In H. Fives & M. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 128–14). Routledge.

Omran, M. G. H., Engelbrecht, A. P., & Salman, A. (2007). An overview of clustering methods. *Intelligent Data Analysis*, *11*(6), 583–605. https://doi.org/10.3233/ida-2007-11602

Onwuegbuzie, A. J. (2025). On quantitizing revisited. *Frontiers in Psychology*, *15*(Article 1421525). https://doi.org/10.3389/fpsyg.2024.1421525

Onwuegbuzie, T. (2024). Just When You Thought that Quantitizing Merely Involved Counting: A Renewed Call for Expanding the Practice of Quantitizing in Mixed Methods Research With a Focus on Measurement-Based Quantitizing. *Journal of Mixed Methods Studies*, *10*, 99–148. https://doi.org/10.59455/jomes.54

Onwuegbuzie, A. J., & Leech, N. L. (2007). Validity and qualitative research: An oxymoron? *Quality and Quantity*, *41*(2), 233–249. https://doi.org/10.1007/s11135-006-9000-3

Pajares, M. F. (1992). Teachers' Beliefs and Educational Research: Cleaning Up a Messy Construct. *Review of Educational Research*, *62*(3), 307–332. https://doi.org/10.3102/00346543062003307

Parmelee, D. X., & Michaelsen, L. K. (2010). Twelve tips for doing effective Team-Based Learning (TBL). *Medical Teacher, 32*(2), 118–122. https://doi.org/10.3109/01421590903548562.

Parmelee, D., Michaelsen, L. K., Cook, S., & Hudes, P. D. (2012). Team-based learning: a practical guide: AMEE guide no. 65. *Medical Teacher*, *34*(5), 275-87. https://doi.org/10.3109/0142159X.2012.651179.

Parsons, S. A., Hutchison, A. C., Hall, L. A., Parsons, A. W., Ives, S. T., & Leggett, A. B. (2019). U.S. teachers' perceptions of online professional development. *Teaching and Teacher Education*, *82*, 33–42. https://doi.org/10.1016/j.tate.2019.03.006

Peck, C., & Herriot, L. (2015). Teachers' beliefs about social studies. In H. Fives & M. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 399–414). Routledge.

Prats, E., Marín-Blanco, A., & Álvarez-López, G. (2019). Elementos para el debate en la iniciación profesional docente en España. In *La iniciación profesional docente: marcos supranacionales y estudios comparados* (pp. 204–220).

Reimschisel, T., Herring, A. L., Huang, J., & Minor, T. J. (2017). A systematic review of the published literature on team-based learning in health professions education. *Medical Teacher*, *39*(12), 1227–1237. https://doi.org/10.1080/0142159X.2017.1340636.

Richardson, V. (1996). The role of attitudes and beliefs in learning to teach. In J. Sikula (Ed.), *Handbook of research on teacher education* (2nd ed., pp. 102–119). Macmillan.

Roberson, B., & Franchini, B. (2014). Getting Your Course Ready for Team-Based Learning. In J. Sibley & P. Ostafichuk (Eds.), *Getting started with team-based learning* (pp. 16-26). Stylus Publishing.

Rodríguez-García, A., & Arias-Gago, A. R. (2022). Bibliometric characteristics of the international literature on teaching methods: a cross-disciplinary taxonomy. *Revista Complutense de Educacion*, *33*(1), 93–106. https://doi.org/10.5209/RCED.73722

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.

Sahlberg, P. (2006). Education reform for raising economic competitiveness. *Journal of Educational Change*, *7*(4), 259–287. https://doi.org/10.1007/s10833-005-4884-6

Saldaña, J. (2003). *Longitudinal qualitative research: analyzing change through time*. AltaMira Press.

Sandelowski, M., Voils, C. I., & Knafl, G. (2009). On quantitizing. *Journal of Mixed Methods Research*, *3*(3), 208–222. https://doi.org/10.1177/1558689809334210

Schraw, G., & Olafson, L. (2015). Assessing teachers' beliefs. In H. Fives & M. Gill (Eds.), *International Handbook of Research on Teachers' Beliefs* (pp. 87–105). Routledge

Sheehan, K. B. (2001). E-mail Survey Response Rates: a Review. *Journal of Computer-Mediated Communication*, *6*(2), JCMC621. https://doi.org/10.1111/j.1083-6101.2001.tb00117.x

Shulman, L. S. (1986). Pardigms and research programs for the study of teaching. In Wittrock (Ed.), *Handbook on research on teaching* (3rd ed., pp. 1–36). Macmillan.

Sibley, J., & Ostafichuk, P. (2014). *Getting started with team-based learning*. Sterling: Stylus Publishing.

Sibley, J., & Parmelee, D. X. (2008). Knowledge is no longer enough: Enhancing professional education with team-based learning. *New Directions for Teaching and Learning*, *2008*(116), 41–53. https://doi.org/10.1002/tl.332.

Sims, S., & Fletcher-Wood, H. (2021). Identifying the characteristics of effective teacher professional development: a critical review. *School Effectiveness and School Improvement*, *32*(1), 47–63. https://doi.org/10.1080/09243453.2020.1772841

Sisk, R. J. (2011). Team-Based Learning: Systematic Research Review. *Journal of Nursing Education*, *50*(12), 665–669. https://doi.org/10.3928/01484834-20111017-01.

Siwatu, K. O., & Chesnut, S. R. (2015). The career development of preservice and inservice teachers why teachers' self-efficacy beliefs matter. In *International handbook of research on teachers' beliefs* (pp. 212–229). Taylor and Francis.

Skott, J. (2015). The promises, problems, and prospects of research on teachers' beliefs. In H. Fives & M. Gill (Eds.), *International Handbook of Research on Teachers' Beliefs* (pp. 37–54). Routledge.

Snider, V. E., & Roehl, R. (2007). Teachers' beliefs about pedagogy and related issues. *Psychology in the Schools*, *44*(8), 873–886. https://doi.org/10.1002/pits.20272

Starkey, L., Yates, A., Meyer, L. H., Hall, C., Taylor, M., Stevens, S., & Toia, R. (2009). Professional development design: Embedding educational reform in New Zealand. *Teaching and Teacher Education*, *25*(1), 181–189. https://doi.org/10.1016/j.tate.2008.08.007

Styron, R. A., Michaelsen, L. K., & Styron, J. L. (2015). Implementing a University-Wide Change Initiative. *To Improve the Academy*, *34*(1–2), 194–233. https://doi.org/10.1002/tia2.20020

Tang, E. L. Y., Lee, J. C. K., & Chun, C. K. W. (2012). Development of teaching beliefs and the focus of change in the process of pre-service ESL teacher education. *Australian Journal of Teacher Education*, *37*(5), 90–107. https://doi.org/10.14221/ajte.2012v37n5.8

Tatto, M. T., & Coupland, D. B. (2003). Teacher education and teachers' beliefs. Theoretical and measurement concerns. In J. Raths & A. C. McAninch (Eds.), *Teacher beliefs and classroom performance: The impact of teacher education* (pp. 123–182). Information Age.

Tatto, M. T. (2019). The Influence of Teacher Education on Teacher Beliefs. *Oxford Research Encyclopedia of Education*, *April 2019*, 1–30. https://doi.org/10.1093/acrefore/9780190264093.013.747

Teo, T., Chai, C. S., Hung, D., & Lee, C. B. (2008). Beliefs about teaching and uses of technology among pre-service teachers. *Asia-Pacific Journal of Teacher Education*, *36*(2), 163–174. https://doi.org/10.1080/13598660801971641

Tondeur, J., Hermans, R., Braak, J. Van, & Valcke, M. (2008). *Exploring the link between teachers' educational belief profiles and different types of computer use in the classroom*. *24*(6), 2541–2553. https://doi.org/10.1016/j.chb.2008.02.020

Tondeur, J., van Braak, J., Ertmer, P. A., & Ottenbreit-Leftwich, A. (2017). Understanding the relationship between teachers' pedagogical beliefs and technology use in education: a systematic review of qualitative evidence. *Educational Technology Research and Development*, *65*(3), 555–575. https://doi.org/10.1007/s11423-016-9481-2

Troman, G., & Woods, P. (2000). Careers Under Stress: Teacher Adaptations at a Time of Intensive Reform. *Journal of Educational Change*, *1*(3), 253–275. https://doi.org/10.1023/A:1010010710255

Valckx, J., Vanderlinde, R., & Devos, G. (2021). Measuring and exploring the structure of teachers' educational beliefs. *Studies in Educational Evaluation*, *70*(February), 101018. https://doi.org/10.1016/j.stueduc.2021.101018

Valckx, J., Vanderlinde, R., & Devos, G. (2024). Do teachers' educational beliefs affect the relationship between departmental leadership and interpersonal PLC characteristics? *Professional Development in Education*, *50*(5), 1001–1018. https://doi.org/10.1080/19415257.2021.1973071

Van Driel, J. H., Bulte, A. M. W., & Verloop, N. (2007). The relationships between teachers' general beliefs about teaching and learning and their domain specific curricular beliefs. *Learning and Instruction*, *17*(2), 156–171. https://doi.org/10.1016/j.learninstruc.2007.01.010

VanGronigen, B. A., Bailes, L. P., & Saylor, M. L. (2023). "Stuck in this wheel": The use of design thinking for change in educational organizations. *Journal of Educational Change*, *24*(4), 699–725. https://doi.org/10.1007/s10833-022-09462-6

Verjovsky, J., & Waldegg, G. (2005). Analyzing beliefs and practices of a Mexican high school biology teacher. *Journal of Research in Science Teaching*, *42*(4), 465–491. https://doi.org/10.1002/tea.20059

Wang, X., Gao, Y., Sun, F., & Wang, Q. (2024). Unveiling the tapestry of teacher belief research: tracing the present and forging the future through bibliometric analysis. *Current Psychology*, *43*(17), 15659–15672. https://doi.org/10.1007/s12144-023-05546-5

Wanzek, J., Vaughn, S., Kent, S. C., Swanson, E. A., Roberts, G., Haynes, M., … Solis, M. (2014). The Effects of Team-Based Learning on Social Studies Knowledge Acquisition in High School. *Journal of Research on Educational Effectiveness*, *7*(2), 183–204. https://doi.org/10.1080/19345747.2013.836765.

Watt, H. M. G., & Richardson, P. W. (2015). A motivational analysis of teachers' beliefs. *International Handbook of Research on Teachers' Beliefs*, 191–211.

Woolley, S. L., & Benjamin, W. J. (2004). *Construct validity of a self-report measure of teacher beliefs related to constructivist and traditional approaches to teaching and learning*. *64*(2), 319–331. https://doi.org/10.1177/0013164403261189

Wyse, D., Brown, C., Oliver, S. and Poblete, X. (2018) *The BERA close-to-practice research project*. Research Report. Retrieved from https://www.bera.ac.uk/researchers-resources/publications/bera-statement-on-close-to-practice-research [Accessed: 15 April 2024].

Zubiri, X. (1980). *Inteligencia sentiente. Inteligencia y realidad.* Madrid: Alianza Editorial.

Zubiri, X. (1982). *Inteligencia y logos*. Madrid: Alianza Editorial.

Zubiri, X. (1983). *Inteligencia y razón*. Madrid: Alianza Editorial.

Zubiri, X. (1999). *Sentient Intelligence*. The Xavier Zubiri Foundation of North America. https://doi.org/10.7551/mitpress/7415.003.0026

6. Article 3: What facilitates or inhibits teaching belief change in continuous professional development? Findings from Spain

6.1 Abstract

The beliefs held by teachers orient their practice, and teachers themselves identify professional development as one of the main sources of their beliefs about teaching. However, very little is known about the dynamics of the factors shaping the evolution of in-service teachers' teaching beliefs in response to compulsory professional development. This longitudinal study addresses this gap in research, analysing the reflective narrative accounts of 55 secondary teachers of over 15 subjects from 11 schools throughout Spain in response to a two-year obligatory development programme. Through thematic analysis, matrices, and an adaptation of the Interconnected Model of Teacher Professional Growth integrating emotions as change mediators, it provides an innovative three-dimensional taxonomy of 28 influential factors, some of them overlooked by the literature. It also provides empirical evidence about how their interaction facilitates or inhibits teaching belief change following 4 distinct patterns. The intended belief change was shaped by the consistency between teachers' prior teaching beliefs and those underpinning the new classroom practice, much more influenced by teachers' perception of students' satisfaction with the new teaching practice than by that of their actual learning, and strongly inhibited by the difficulty of planning lessons for the new classroom practice. The study makes recommendations for policy and practice.

Keywords: Professional development · Teacher growth · Teachers´ beliefs · Teaching beliefs · Team-Based Learning · Educational change

6.2. Introduction

The beliefs held by teachers inform and orient their approach to teaching practice (Fives et al., 2019; Fives & Buehl, 2012; Peck & Herriot, 2015; Skott, 2015), and teachers themselves identify their own teaching experience, pre-service teacher education programmes, and continuous professional development (CPD) as some of the main sources of their beliefs about teaching (Chung, 2018, 2022; Fives & Buehl, 2012; Levin, 2015; Levin et al., 2013; Levin & He, 2008; Li & Huang, 2023). It can thus reasonably be expected that, within contexts of school reform towards constructivist curriculum

approaches such as that promoted by the Spanish applicable education law (LOMLOE, 2020), the implementation of tailor-made CPD programmes helping teachers pilot new teaching strategies will promote the development of their beliefs about teaching and, as a result, an adaptive change in their classroom practices. This expectation is supported by reviewers within the field of teachers' beliefs, who contend that beliefs and practices evolve in reciprocal interaction and highlight that the key question is to understand how this evolution depends on both the kind of belief and on personal and contextual factors (e.g., Buehl & Beck, 2015). This emphasis on the need for research into the factors shaping the evolution of teachers' beliefs at large has also been highlighted by reviewers concerning the beliefs that teachers hold about how to teach or teaching beliefs (TBs) in particular (e.g., Levin, 2015).

Some scholars have listed the most relevant factors facilitating or hampering changes in teachers' beliefs at large, particularly in response to teacher education (Fives et al., 2019; Fives & Buehl, 2012; Gill & Hardin, 2015; Girardet, 2018; Levin, 2015). However, the interaction between these factors is complex, and an appropriate understanding of possible changes would require an 'ecological' approach addressing several together (Ashton, 2015; Buehl & Beck, 2015; Fives & Buehl, 2012). A helpful perspective may be the distinction between individual and contextual factors (Fives & Buehl, 2012; Girardet, 2018). At individual level, prior beliefs already held by teachers can 'filter' the way teachers learn professionally (Fives & Buehl, 2012), and recent research has shown how prospective teachers' beliefs changed differently according to the degree of consistence between their prior beliefs and the pedagogical approach of the pre-service teacher education programme (Dang et al., 2024). In this sense, 'longevity' is important, as old beliefs in experienced teachers tend to be resistant and stable (Fives et al., 2019). Type and strength of beliefs are also relevant, as those more central for teachers' identity may be more difficult to change. Teachers' initial predisposition is paramount, as those unwilling to change may be reluctant to pilot new approaches, although this 'can be moderated by teacher self-efficacy' (Girardet, 2018).

Concerning contextual factors, time is critical because 'change in teachers' beliefs should be acknowledged as a long-term process' (Fives et al., 2019; Thompson, 1992). Moreover, the

institutional culture, for example in terms of leadership or collective beliefs (Tschannen-Moran & Um, 2015), and even 'the school system as a whole', for example through a strong emphasis on standardised testing, can determine whether and how teachers' beliefs change (Arora, Kean, & Anthony, 2000; Cady, Meier, & Lubinski, 2006; Girardet, 2018; Swan & Swain, 2010). Cultural values and traditions can also impact pedagogical beliefs (e.g., He et al., 2011), as well as years of teaching experience and career stage (Levin et al., 2013). Other factors that might also influence belief change remain virtually unexplored due to 'the lack of diversity among participants in research on teachers' beliefs' at large, such as urban or rural schools, male or female teachers, socio-economic context, and disciplines (Levin, 2015).

Scholars increasingly emphasise the importance of emotions for teaching and learning and thus for teachers' beliefs (Frijda & Mesquita, 2000; Nespor, 1987; Siwatu & Chesnut, 2015; Watt & Richardson, 2015). For some authors, emotions are 'the most important component of belief change' (Ashton & Gregoire-Gill, 2003, p. 107), and 'may strengthen existing beliefs, refute new ideas, or spark new beliefs salient for teaching' (Fives et al., 2019, p. 10). This perspective has given rise to several 'hot models of belief change' contending that emotions should not be ignored when addressing belief change (Gill & Hardin, 2015, p. 231), but the relationship between teachers' emotions and their beliefs remains a glaring gap in research (Bächler et al., 2018; Cheung & Hennebry-Leung, 2020; Egloff & Souvignier, 2020).

However, despite the importance attached by teachers to CPD as a source of their TBs and that of CPD as a driver for educational change, longitudinal studies of no small scale addressing the evolution of teachers' TBs in response to compulsory, generally oriented CPD are scant, and the dynamics between the factors shaping this evolution remain uncharted. A recent study provides evidence of the existence of three profiles in the evolution of the TBs of 55 Spanish secondary teachers in response to a two-year, compulsory CPD programme (self-reference to article 2). This paper further develops that study and addresses the above-mentioned gap in research by exploring the following research questions:

a) What factors did facilitate or inhibit change in TBs?

b) What dynamics between these factors did shape this change or its absence?

6.3 Context and CPD programme

In contrast to other countries that advocate more traditional, content-rich models, the Spanish education system has progressively adopted successive organic laws with a constructivist curriculum approach (e.g., Monarca & Rappoport, 2013). This process following the OECD Learning Compass 2030 (OECD, 2019) has led to the currently applicable organic law (LOMLOE, 2020) that, in deepening into a competence-led approach to teaching practice (e.g., López Rupérez, 2022), is requiring that teachers develop new TBs, as Spanish classroom practices remain overwhelmingly traditional and content-focused (Rodríguez-García & Arias-Gago, 2022). However, this legal pressure to change classroom practices has not been matched by sufficient official and administrative support to teachers' growth (e.g., Prats et al., 2019), and school leaders and organisations committed to the intended educational change have no choice but to develop their own professional development strategies. Within this unfavourable context, this longitudinal study explores the factors influencing the evolution of the TBs of 55 Spanish baccalaureate and vocational education teachers under the umbrella of a school federation in response to a two-year, tailor-made CPD programme during the first two years of application of the LOMLOE.

This programme was the second stage of a school federation's wider programmatic educational change effort. In the first stage, 52 innovators and early adopters (teachers willing to pilot changes even when the benefits are uncertain) voluntarily participated in a CPD programme to check how far a university methodology called Team-Based Learning (TBL) could help secondary teachers grow professionally and change their TBs by piloting a competence-led classroom practice. TBL provides teachers with a structured sequence of classroom activities that ensures the adoption of a genuinely constructivist, student-centred approach by transforming the task of teachers in the classroom, who are challenged to become facilitators of learning rather than mere instructors and thus to develop a new set of skills (Hrynchak & Batty, 2012; Kubitz, 2014; Michaelsen & Sweet, 2008; Roberson & Franchini, 2014). These skills concern teachers' action in both the pre-class lesson planning and the

classroom practice phases, and their development requires ‘a steep learning curve’ (Nelson & Tweddell, 2017, p. 103).

In the second stage, that addressed by this study, 60 teachers were compulsorily enrolled in the same CPD programme promoting the use of TBL. This group of teachers was intended to represent the ‘early majority’ of teachers, who are open to change but only after seeing some evidence that this change does work. From this group, 55 teachers voluntarily agreed to participate in this study. The programme, which ended up being replicated at international level (Darby et al., 2023) (self-reference), met the requirements of effective teacher professional development (Borko, 2004; Darling-Hammond et al., 2017; Langelaan et al., 2024; Parsons et al., 2019; Sims & Fletcher-Wood, 2021; Starkey et al., 2009) by blending an initial two-day, face-to-face training with two-year mentoring in an online community of practice. In the former, teachers experienced first-hand the type of learning experience caused by TBL in students, started the design of their first TBL lesson plan, and reflected on the scope of both the change that TBL would represent in their teaching practice and the professional growth that the whole CPD programme could promote. In the latter, teachers shared their experience with, and received personalised, timely feedback on, the design and implementation of 6 termly TBL lesson plans throughout 2 academic years, and they were prompted to reflect on the relevance of their participation in the programme for their professional growth after years 1 and 2 (Figure 25). This focus on lesson planning is essential, as teachers start to enact their TBs already in the lesson planning phase of teaching that guides their classroom practice.

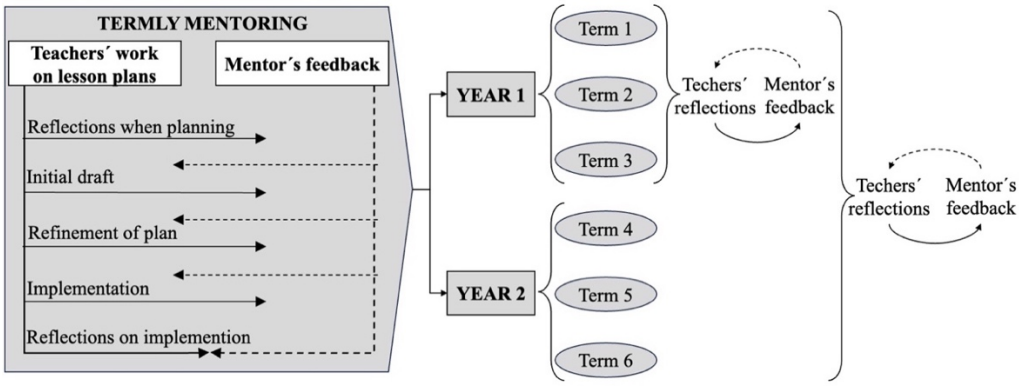


Figure 25: structure of the mentoring process

6.4 Theoretical framework

We drew on an adaptation of Clarke & Hollingsworth's (2002) Interconnected Model of Teacher Professional Growth (IMTPG). Apart from accounting for the complexity of belief change better than linear models (e.g., Guskey, 2002), it is entirely consistent with the assumptions of this study according to Boylan's et al. (2018) analytical framework for professional growth models. Moreover, its 4 domains of teachers' professional activity perfectly match the overarching themes uncovered in teachers' reflections through thematic analysis. The IMTPG contends that change or professional growth can occur in every domain and is always the result of different interactions with the rest of them. Figure 26 shows its application to our intervention. The beliefs about teaching held by teachers, along with their attitudes and knowledge, belong to the 'personal domain', where changes are the result of the interaction with different factors situated in the other three domains. The 'external domain' refers to the realm located 'outside the teachers' personal world' (p. 951), including educational laws and CPD programmes. The 'domain of practice' concerns teaching practices as well as the methodical innovations piloted by teachers as a result of, for example, their participation in CPD programmes, such as designing TBL lesson plans and implementing them. Finally, the 'domain of consequences' comprises teachers' main interpretations of the results of this practice or its 'salient outcomes' such as, for example, student learning and motivation.

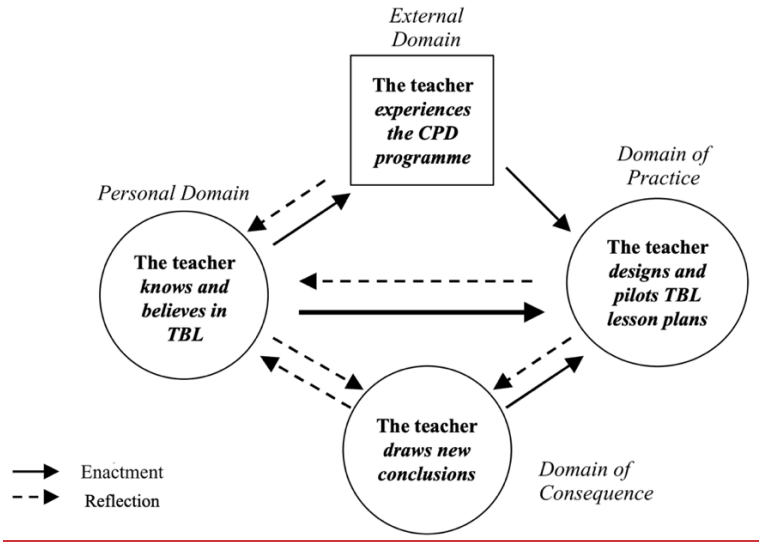


Figure 26: application of Clarke & Hollingsworth's (2002, p. 957) IMTPG to the school intervention

The transmission of change between domains is conveyed through two processes or 'mediators of change': 'enaction' and 'reflection'. The former is the application of something new, be it a new belief or a new methodology, rather than just doing something as usual. For example, teachers participating in the CPD programme piloted TBL as an innovative teaching practice. The latter is the intellectual effort made by teachers as an 'active, persistent and careful consideration' (Clarke & Hollingsworth, 2002, p. 954; after Dewey, 1910) about what happens in every domain. Within this framework, the interplay between domains can lead to change in one domain only, or in several of them. If the former, there is a 'sequence change', where change tends to be situational and transitory. If the latter, a 'growth network' occurs, which points to durable change and thus to professional growth.

Our use of the IMTPG as analytical tool required some adaptations. Firstly, teachers' enactment of their TBs concerns not only classroom practices but also the lesson planning phase guiding them. Secondly, our intervention is better understood assuming that the form of reflection consisting of 'changes in the teachers' beliefs that lead to a re-evaluation of changes in the domain of consequence' (Clarke & Hollingsworth, 2002, p. 954) actually concerns all domains. This re-evaluation, in turn, can be considered as a change mediator distinct from reflection and enaction: the application of beliefs that are in ongoing change during the intervention. For example, teachers' evolving self-efficacy with TBL during the CPD programme led them to be interested in keeping piloting it or to give up doing so. Thirdly, the review of the literature and our experience in the previous stage of the CPD programme led us to align with scholars emphasising the role of emotions in adult learning (e.g., Yorks & Kasl, 2002), and particularly with Harvey et al. (2019), who contend that written reflection for learning includes an 'affective domain' distinct from thinking or reasoning. In our view, the application of the IMTPG provides a more nuanced understanding of belief change assuming that reflection as 'change mediator' is cognitive and emotional.

Accordingly, we complemented our interpretation of the cognitive content of reflections with sentiment analysis, which explores 'sentiments' by classifying emotions as positive and negative (e.g., Mohammad & Turney, 2010, 2013) and allows to elicit the emotional component of teachers' reflections as mediators facilitating or inhibiting the intended belief change. It builds on `sentiment lexicons´ that

list ‘sentiment words’ implying positive emotions (e.g., hope, brilliant, enjoy) and negative emotions (e.g., doubt, immature, absenteeism). Sentiment analysis requires interpretation, as the emotion implied by these words are sometimes context-dependant. For example, the same sentiment word might imply opposed emotions, sentiments words not always express any emotion, and some sentences without sentiment words can imply emotions. This is why we drew on Liu’s (2020) ‘aspect-based sentiment analysis’, which provides methods to elicit the sentiments implied in written texts, going beyond language units (e.g., sentences) by looking at the contextual aspects targeted by ‘sentiment words’. For example, a reflective sentence about the CPD programme could be mixed, suggesting opposed emotions depending on different aspects of the programme, such as planning lessons and piloting them.

6.5. Methods

We draw on Zubiri’s (1980, 1982, 1983, 1999) subtle realism and adopt an interpretive epistemology assuming the researchers’ inherently insider position from which we can aspire to a trustworthy interpretation rather than to an unbiased description. The position of the main researcher as the teacher educator of the programme, senior TBL Trainer-Consultant, and practising K-12 teacher was advantageous in terms of credibility but did not allow to preclude possible vested interest. To maximise the trustworthiness of our interpretation, we turned to some strategies that are available in the literature (Anney, 2015; Lincoln & Guba, 1986; Onwuegbuzie & Leech, 2007), using a digital research journal as a tool for transferability, dependability, and confirmability.

6.5.1 Data collection

From the 60 teachers initially enrolled in the programme, 5 left the organisation during their participation. Accordingly, we collected data of 55 teachers from 11 state-sponsored schools of the federation in 8 autonomous regions throughout Spain with very different contexts in terms of school size, location, language (Spanish, Galician, and Valencian), socio-economic background, and regional adaptation of the LOMLOE. In terms of gender, 31 were female and 24 male, mirroring the distribution of the Spanish school system in post-obligatory, secondary schooling (MINEDUC, 2024). They taught over 15 different subjects grouped in STEM (19 teachers) and other disciplines (36 teachers). They were baccalaureate or vocational education teachers (46 and 9 respectively) and their

teaching experience covered all the career stages of Huberman's (1992) approach to teacher development. In total, 244 TBL lesson plans were designed and piloted out of the 330 expected, although the level of engagement was unequal between participants, and the number of plans (142 in year 1, and 102 in year 2), as well as the amount teachers´ comments and their reflective character diminished progressively across the 2 academic years.

The data collected occurred naturally in the CPD programme and include all the reflections, comments, and lived experiences shared by teachers throughout 2 academic years within the online community as a result of the face-to-face training and the mentoring process. The conversation threads between the mentor (lead researcher) and participants were chronological, reflective weblog entries crystalising in self-reflective writings in electronic portfolios, 2 of the most frequently used qualitative data collection instruments within the field of teachers' beliefs (Hoffman & Seidel, 2015; Schraw & Olafson, 2015). We copied and pasted these self-reflecting writings of the individual online portfolios in 55 Microsoft Word files with 8 pages per teacher on average, specifying the date and time of every comment, so that these files represent unitary, reflective narrative accounts of teachers´ professional development during the 2-year CPD programme. When doing so, we took every step to anonymise participant by substituting their identity and that of their school with numbers and letters respectively once the data were collected.

6.5.2 Data analysis

Our analysis included 4 phases. In phase 1, we used the NVivo 14 software package and developed a thematic framework using an adaptation of Spencer, Ritchie, O´Connor et al. (2014) approach to thematic analysis to identify the influential factors. In phase 2, we used the resulting framework and general matrices to explore the nature of the factors identified according to three dimensions: their character (facilitators or obstacles), their relevance, and their domain of professional growth. In phase 3, we applied the IMTPG in the light of the three-dimensional nature of factors to find the possible change sequences and growth networks facilitating or inhibiting he intended change in TBs. Finally, in phase 4, we used the general matrix to explore the possible association of every factor with different subgroups of teachers.

6.5.2.1 Phase 1: identifying the influential factors

We tried to remain as exploratory as possible to capture the richness of influential factors, being aware that a theory-free emergence of codes (Glaser & Strauss, 2017) would have been 'epistemically naïve' (Gläser & Laudel, 2013, p. 14) for at least two reasons: a) some codes would label elements that we were previously 'sensitized to in the process of reading the literature' (Elliott, 2018, p. 2855); and b) the subthemes inductively uncovered in the analysis would ultimately be arranged according to the domains of the theoretical framework. The thematic framework was designed in three stages. The first two ones followed a circular process with two recurrent steps: a) coding passages of teachers' comments; and b) grouping and structuring the resulting codes through a progressive abstraction process with 4 levels including elements (initial codes), aspects (groups of elements), categories (groups of aspects), and subthemes (groups of categories). The third step arranged the subthemes inductively uncovered according to the domains of the theoretical framework, which became the themes of the thematic framework (Figure 27). We coded passages verbatim in Spanish with quotation marks to 'stay grounded in the data' (Spencer, Ritchie, O'Connor et al., 2014, p. 299), leaving translation into English for the subsequent process of abstraction and selecting small text pieces to facilitate further `nuanced analysis´ (Saldaña, 2021, p. 34).

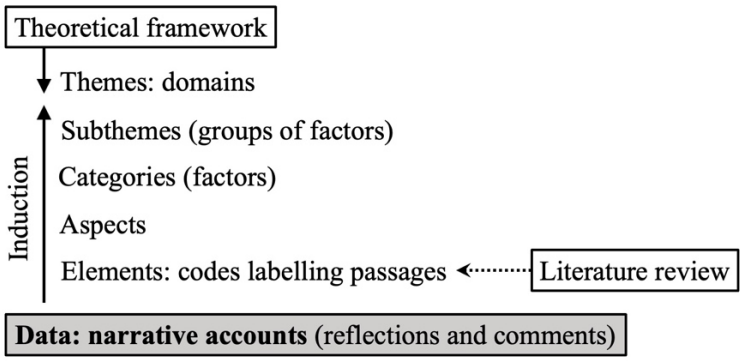


Figure 27: development of the thematic framework

To increase the reliability and transparency of our analysis, we recorded how codes, themes, and subthemes progressively emerged in four ways: a) defining codes, themes, and subthemes with a description in their node properties, although the definition of the latter changed according to the structure of the evolving thematic framework; b) making incremental copies of the file so that those

interested could easily review the different stages of the emergence of the thematic framework; c) including any decision made throughout this process on a daily basis in a digital research journal to record when and why we made a particular decision; and d) making incremental backups of this research journal to track and record its evolution.

6.5.2.2 Phase 2: exploring the nature of factors

Grouping the factors identified according to their domain of professional growth (theme), we used matrices to uncover how far (relevance) they facilitated and/or inhibited (character) the intended change in TBs. In terms of character, we used framework matrices crossing every factor with every participant and interpreted whether their verbatim reflections had a positive, negative, or neutral tone by considering not only their reasoning but also the possible emotions implied by words at the aspect level. To do so, we drew on the NCR Emotion Lexicon (Mohammad & Turney, 2010, 2013), which is the largest publicly available emotion lexicon, has proved to be highly accurate according to the 'Naive Bayes' classification algorithm (Pradhan et al., 2023), has been accurately translated into Spanish (Mohammad & Turney, 2024), and is stable across languages Dip & Silenzi (2024). For example, "Designing [TBL] lesson plans takes much time, but I really love students' motivation and commitment" has a positive tone, but it is not completely positive. At aspect level, the content suggests that the planning phase of teaching is an obstacle and students' engagement is a facilitator, which is supported by 'love' as a positive sentiment word. This allowed us to determine whether factors acted as facilitators or obstacles in each participant.

Then, we created a general matrix crossing participants (rows) with factors (columns), which in turn were grouped according to domains of professional growth and encompassed two columns (facilitator/obstacle). We included the reflections concerning every participant as notes, if any, so that we would be able to access them by hovering the mouse over the corresponding cells, and we coloured them in black (reflections were recurrent and/or emphatic), grey (reflections were neither recurrent nor emphatic), or white (no reflection) to have an initial, visual understanding. This matrix allowed us to uncover three dimensions in every factor: domain, character, and relevance. It enabled us to determine whether each factor acted in the sample of 55 participants as a facilitator (only

facilitator or mainly facilitator), as a mixed factor (more facilitator than obstacle, equally facilitator and obstacle, or more obstacle than facilitator), or as an obstacle (mainly obstacle or only obstacle). It also enabled us to evaluate the relevance of the influence of each factor by focusing on three attributes: prevalence (the proportion of teachers with reflections implying a factor), insistence (the number of reflections implying a factor in the same teacher), and emphasis (the strength of the reflection, for example using capital letters, sentiment words, or exclamation points). We situated every factor along a continuum according to these attributes and determined whether the influence of every factor was very relevant (prevalent, as well as insistent and/or emphatic), relevant (whether prevalent but neither insistent nor emphatic, or not prevalent but insistent or emphatic in some teachers), of some relevance (referred to by about half of teachers but neither insistent nor emphatic), or just tangential (referred to by just a few of teachers).

6.5.2.3 Phase 3: understanding the underlying dynamics between factors

Using the graphical representation of the IMTPG, we first distributed the factors identified according to domains, and then we identified how enaction, reflection, and re-evaluation as change mediators could have occurred in the school intervention (Figure 28): a) the change in TBs provoked by the CPD programme (arrow 1); b) the re-evaluation of the mentoring process in the light of the TBs reshaped over the course of the CPD (arrow 2); c) the enaction of the new teaching method informed by the new TBs both when designing and then when piloting 6 termly TBL lesson plans (arrow 3); d) the enaction of the new knowledge about TBL and the new self-efficacy beliefs developed in the in-person training (arrow 4); e) the change in TBs caused by teachers' reflection on their experience with the design and implementation of the lesson plans, before considering the salient outcomes in the domain of consequences (arrow 5); f) the re-evaluation of this experience in the light the of the TBs reshaped during the CPD (arrow 6); g) teachers' reflection on what happened in the classroom (arrow 7); h) the change in TBs derived from this reflection on the salient outcomes of the new classroom practice (arrow 8); i) the re-evaluation of the salient outcomes in the light the of the TBs reshaped over the course of the CPD (arrow 9); and j) the enaction of new TBs crystallised by the influence the salient outcomes (arrow 10). We read and re-read participants' reflections to analyse how far the

processes of change identified suggest existence of change sequences and growth networks in the light of the three-dimensional nature of factors.

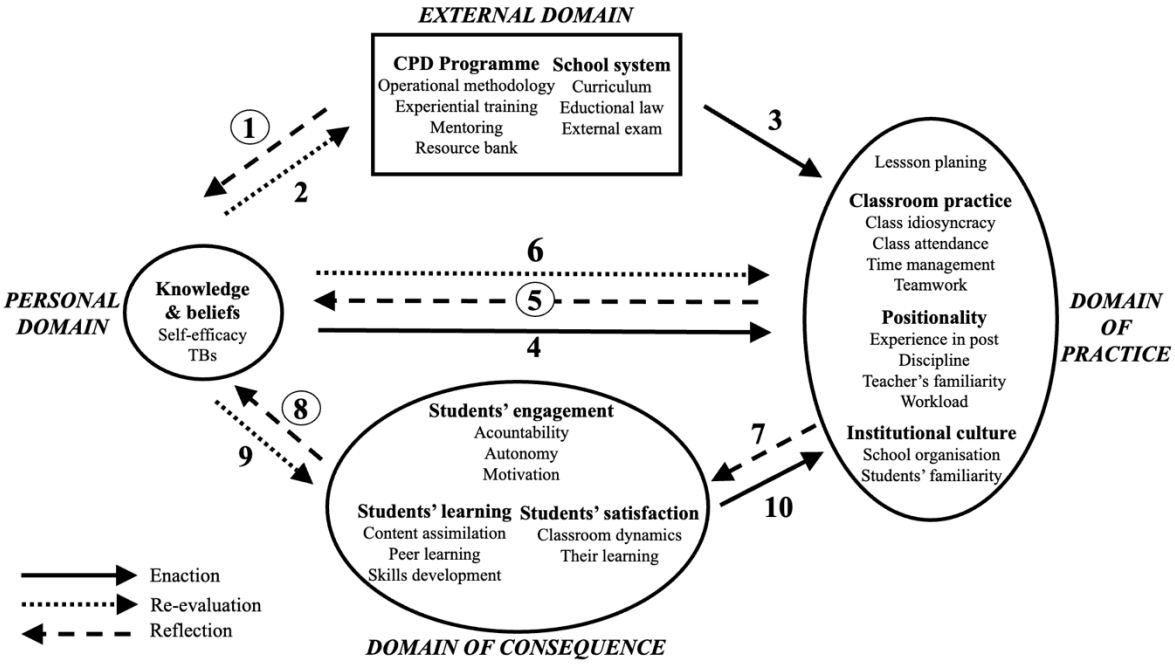


Figure 28: dynamics between factors adapting Clarke & Hollingsworth's (2002, p.957) framework

6.5.2.4 Phase 4: uncovering possible associations between factors and subgroups of teachers

We created 4 copies of the general matrix and divided them according to participants' gender, years of teaching experience, discipline, and educational setting (Baccalaureate or Vocational education) to evaluate how far the possible differences in patterns suggested a degree of association between factors and these demographic variables.

6.6 Ethical considerations

The main researcher obtained ethical approval for this study from the university where he is affiliated. The data, naturally collected as part of the school intervention, were not sensitive and very unlikely to cause any harm. To maximise their understanding of the nature of the study, the implications of participating, and their right to withdraw from it without any justification at any stage before the end of data analysis, participants were informed in person by the main researcher during the face-to-face training of the CPD programme and also in written form after it. To minimise issues of power, informed consent for voluntary participation was collected online, and the possibility of withdrawing

was enabled via personal email to the main researcher or a private message to him in the online community of practice. We took the necessary steps to ensure confidentiality by anonymising participants when processing data.

6.7 Findings

6.7.1 The three-dimensional taxonomy of influential factors

The analysis conducted in phases 1 and 2 enabled us to create a three-dimensional taxonomy of 28 factors (Table 11) specifying in every factor the domain (row), the continuum between only facilitator and only obstacle (column), and the continuum between great relevance and virtually no relevance (type). This taxonomy provides an initial understanding of the factors by focusing on each one of the 3 dimensions. In terms of domain, whereas the factors concerning the domain of practice acted both as obstacles to and as facilitators of the intended change in TBs, those included in the domain of consequence acted always as facilitators. This suggests that, while challenging, the new teaching practice paid off for teachers. Moreover, within the external domain, the factors concerning the CPD programme acted always as facilitators, whereas those concerning the school system acted only as obstacles, suggesting that the new educational law by itself without the appropriate support was virtually irrelevant and very likely to fail or even backfire. In terms of factor character, the typology suggests that the factors performed much more as facilitators than as obstacles, as well as that the influence exerted by several facilitators were very relevant, whereas that exerted by obstacles was much weaker. Finally, in terms of relevance, the factors exerting a very relevant influence concerned the CPD programme, which aligns with the centrality of the support that teachers need to receive within contexts of school reform mentioned in the introduction. Moreover, and very interestingly, the taxonomy suggests that teachers' perception of students' attitude towards the new classroom practice proved to be more influential for the intended change than that of students' actual learning and skill development, which is new within the field of teachers' beliefs.

Table 11: three-dimensional typology of factors combining domain, character, and relevance

		FACILITATOR		MIXED		OBSTACLE	
		Only facilitator	**Mainly facilitator**	**More facilitator**	**More obstacle**	**Mainly obstacle**	**Only obstacle**
PERSONAL DOMAIN	**Knowledge & beliefs**			**TBs**			Self-efficacy beliefs
EXTERNAL DOMAIN	**CPD programme**	**OPERATIONAL MET. MENTORING** Resource bank *Experiential training*					
	School system		*Educational law*				**Curiculum External exam**
DOMAIN OF PRACTICE	**Classroom practice**			**TEAMWORK**	Time management	**Lesson planning** *Class attendance*	
				Class idiosyncracy			
	Positionality			Familiarity with new teaching practice		Subject-matter specificities	**Workload** Inexperience in the post
	Institutional culture			**Students' familiarity with teaching practice**		School organisation	
DOMAIN OF CONSEQUENCE	**Students' engagement**		**Motivation**	**ACCOUNTABILITY**	**Autonomy**		
	Students' learning	**Skills development** *Peer learning*	**Content assimilation**				
	Students' satisfaction		**WITH CLASSROOM DYNAMICS**	*With their learning*			
		BOLD CAPITALS = VERY RELEVANT **Bold normal = relevant** Normal = of some relevance *Italic = tangential*					

6.7.2 The dynamics between factors

6.7.2.1 One change sequence and three growth networks

The analysis conducted in phase 3 suggests the existence of 1 change sequence and 3 growth networks shown in Figure 29. The change sequence (a) concerns the personal and the external domains, manifesting the changes in the former. In the first two growth networks (b), the external domain connects with the domain of practice and this, in turn, with the personal domain. In both networks changes happen in the two latter domains, the difference being that the changes in the domain of practice occur before classroom time in one of them (planning phase of teaching) and during classroom time in the other one (classroom practice). The third growth network (c) connects the domain of practice with that of consequences and this, in turn, with the personal domain, driving changes in all three domains.

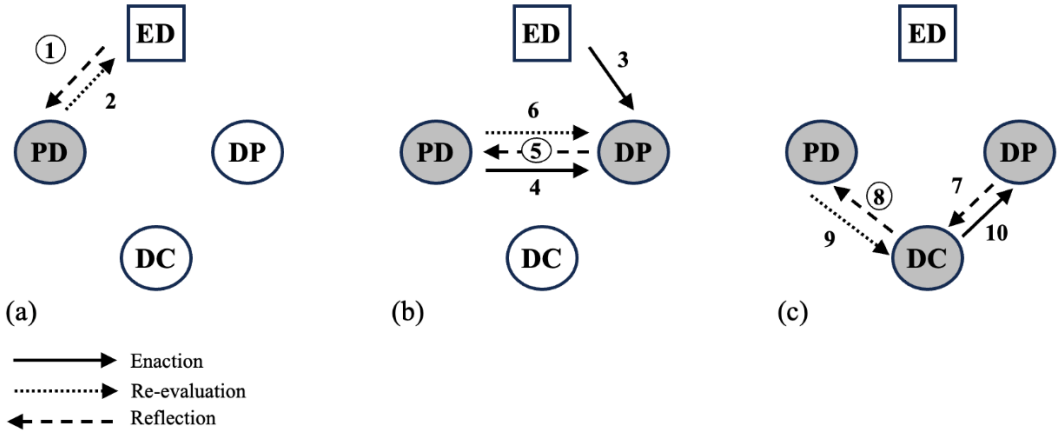


Figure 29: change sequence and growth networks, based on Clarke & Hollingsworth (2002, p.959) (PD = personal domain; ED = external domain; DP = domain of practice; DC = domain of consequences).

6.7.2.2 Change sequence

The influence of the factors concerning the CPD programme was implied by the 82% of teachers, who reflected on them always with a positive tone, and in many cases emphatically and/or recurrently (arrow 1). They acted only as very relevant facilitators of the intended change in TBs for 3 reasons: a) it enabled them to experience the new methodological approach as if they were students; b) they perceived that it was effectively transferable to their teaching

practice; and c) they realised that it contributed to their professional growth. However, this adaptive evolution of TBs appeared to follow two different patterns, according to 2 distinct re-evaluations of the relationship between teachers' prior TBs and those developed in their experience with the two-year mentoring process (arrow 2). Some teachers highlighted their consistency, as if the training had reinforced the TBs that they already had. Others, in contrast, emphasised a degree of inconsistency, thus moving towards more constructivist TBs. The positive tone concerned both the content of reflections (expressing joy, hope, satisfaction, and even enthusiasm) and the sentiment words used (remarked in bold hereafter):

> *This training has confirmed my convictions about education and **helped** me to structure them much **better** (Participant 51).*
>
> *I thought that traditional lecturing was the only teaching practice suitable to prepare students for external exams. Now [after the training], I think that we can **achieve** this goal using active methodologies… (Participant 14).*
>
> *The training **exceeded** my expectations, and we all left **enthusiastic**… (Participant 38).*

The mentoring process with sustained support and timely feedback is particularly worth mentioning, as it was repeatedly referred to by virtually all 55 teachers in positive tone and represented the most influential factor, acting always as a relevant facilitator. Emphatic references to emotions such as joy, excitement, and gratitude, as well as positive sentiment words permeate through the written reflections of most teachers:

> *As always, I´m so thankful that you are there. It´s very **important** for me to can **count** on you in this process [participant 2].*
>
> *What a **joy**! I´m so **happy** to have made **progress**. Thank you very much indeed for your feedback [participant 5].*

6.7.2.3 Growth network 1: TBs and lesson plans

The enaction of the TBs underpinning the new teaching practice promoted by the CPD programme (arrow 3) and of the new knowledge about it gained during their participation (arrow 4) changed teachers' action concerning the design of lesson plans guiding their classroom practice. Their reflections on these changes (arrow 5) suggest that the challenging nature of planning lessons using TBL and the workload endured when doing so were relevant

obstacles for the intended change in TBs. They remarked both the steep learning curve and the amount of time required, as designing lesson plans 'takes a lot of preparation' and 'is **difficult'**, and sometimes they 'get stuck'. Moreover, most of them complained of being 'very busy' and emphasised that 'the vortex of the workday routine', their 'frantic' activity, and their '**anxieties** and rushes' hampered the design of TBL lesson plans, using negative sentiment words. This is why the growing resource bank of lesson plans created as part of the CPD programme acted as a facilitator, being referred to positively (e.g., 'formidable', 'fantastic') and often with positive sentiment words such as '**brilliant'**, '**excellent'**, 'very **beneficial'**, and '**powerful** tool'.

Teachers' reflections on TBL emphasising its inconsistency with their prior TBs led them to diminish their self-confidence in their teaching skills. They re-evaluated the design of TBL lesson plans from these reshaped self-efficacy beliefs (arrow 6), which acted as an obstacle of some relevance. They focused on emotions and used negative sentiment words such as '**fear**', being 'a bit **scared**', having 'a lot to learn', and feeling '**inexperienced'** or '**insecure'** when facing the new approach to lesson plans. Moreover, the pressure exerted by external exams was experienced as a hindrance by some Baccalaureate teachers, expressing their concern that this new approach was 'away from the model of the external exam [and] can mislead students'. However, teachers' reflections also suggest how becoming progressively more skilled in the design of lesson plans increased their self-confidence and thus their ongoing re-evaluation of planning TBL lessons:

> *Two years of evolution in TBL, from the initial **fear** to the **excitement** of designing a new TBL lesson plan… [participant 3].*

6.7.2.4 Growth network 2: TBs and classroom practice

The enaction of the tasks of the CPD programme (arrow 3) and of the new knowledge about it gained during their participation (arrow 4) also changed teachers' classroom practice. Teachers' reflections on their experience with this new classroom practice (arrow 5) suggest the existence of two patterns of influence in the evolution of TBs. Some teachers expressed negative sentiment words and pessimistic reflections, pointing to a possible maladaptive change in their TBs. For

example, participant 33, who was ‘very **sad**’ with the implementation of her first lesson plan and then completely disengaged from the CPD programme. Others shared optimistic views and positive sentiment words, like participant 9, who concluded that ‘It was **great** to go into those classes, because we all knew that the time would fly by’.

Some factors implied by teachers within the domain of practice represented barriers for the intended change in TBs. Some teachers referred to absenteeism, subject-matter specificities, school organisation, and experience in the post as obstacles and never as facilitators. For example, they complained that students missing one class ‘break the dynamics of teamwork’, that this teaching practice ‘is **hardly** applicable’ in their subjects, that they were ‘rather **lost**’ because it was their first year teaching that subject, or that ‘**unexpected** school activities set by the management team’ broke the dynamics of their TBL lessons. Some of them also addressed time management in the new classroom practice more as an issue than as an advantage. Lessons can be ‘more devoted to reflection, analysis, and argumentation, which is unusual in traditional lecturing’, but ‘they take more time than expected…, making it **difficult** to cover all the syllabus’. Students’ particularities as a class group and their familiarity with the new practice were experienced equally as facilitators and hindrances. Just as some teachers complained about particularly unmotivated groups, so rejoiced others that theirs were ‘very **good** groups’. Similarly, some teachers lamented that they were still unfamiliar with the new practice, while others felt reassured that this can be ‘sorted out by practice’. Teamwork and students’ familiarity with the new methodology were particularly prevalent and were considered more facilitators than obstacles. Some teachers protested that in teamwork ‘some students take advantage of others’ work’, but the experience that ‘it was a **delight** to see them [students] work in teams’ and ‘learn by debating’ was more common. Likewise, some teachers lamented that several school colleagues were participating in the CPD programme, as ‘students got a bit **saturated** with the new teaching practice’. However, more realised that ‘the fact that they do it frequently, and from different subjects, makes it **easier** for them to enter into a familiar dynamic’.

As in Growth network 1, teachers' comments also suggest an ongoing re-evaluation of their experience piloting the new classroom practice (arrow 6), which changed their self-efficacy, leading them mainly to be interested in keeping piloting TBL, but also to give up doing so:

> *I felt a bit **insecure** due to **inexperience**, but that was fixed by practising more (participant 55).*
>
> *We are getting **better** and **better** at handling these units with students, I think it has been much more usable than previous ones (participant 38).*
>
> *I was very anxious… Activities were a **disaster**, I was very **sad** and had to stop… I have a lot to learn (Participant 33, who piloted only part of the first unit).*

6.7.2.5 Growth network 3: TBs, students' response, and teaching practice

Reflecting on the experimentation of TBL (arrow 7), teachers interpreted the changes entailed by the new teaching practice in terms of its most relevant outcomes, focusing on three groups of factors that concern students' response and acted as facilitators of the intended change in TBs: learning, engagement, and satisfaction. They realised that the new teaching practice improved students' learning in helping them 'learn from each other', gain deeper knowledge, and develop skills such as 'deductive thinking and logical reasoning, in-depth analysis of theoretical concepts…'. They also inferred that it was remarkably engaging. It is true that some teachers remarked that this practice was unsuitable due to the lack of students' autonomy and intellectual maturity, but most of them concluded that TBL increased students´ motivation, 'enthusiasm', and their 'implication and initiative' during the lesson. What is more, teachers became aware that students themselves enjoyed both the new classroom dynamics and their resulting learning:

> *They tell me that they have learned **better** than in the traditional way. (participant 51)*
>
> *Designing [TBL] lesson plans takes much time, but I really **love** students' motivation and commitment. (Participant 3)*
>
> *… today we have finished the TBL lesson, and the truth is that students have valued it very, very **well**… A **SUCCESS**. THANK YOU. (participant 22)*

Teachers' reflections on these outcomes (arrow 8) led to the evolution of their TBs following three patterns. Very few teachers appeared to reinforce their initial skepticism about

constructivist approaches. This was the case of participant 29, who recognised his own unfamiliarity with active pedagogies before the CPD programme and expressed his final dissatisfaction using negative sentiment words: 'the experience with TBL in mathematics has been **catastrophic** because students get **overwhelmed**…'. Some teachers, in contrast, appeared to reinforce their initial confidence in active pedagogies, as participant 6, who initially stated that the new methodology 'is aligned with what I try to practice in my lessons' and concluded after year 1 that she was 'very **happy'** with it. Most teachers, however, seemed to have experienced the intended change in TBs, as they were unfamiliar with, or skeptical about constructivist approaches but ended up being satisfied or even enthusiastic about the outcomes of the new practice, as the content and the sentiment words of their reflections suggest:

> *Well, I **loved** being able to give a twist to the way I share content and teachings with my students.... Students **like** this way of learning… I **like** it (participant 48).*

> *It has been a new experience, very **enriching**. Students found it **interesting**, like a **relaxation** of the usual practice… It´s very likely that I will try to complete the physics syllabus [using the new methodology] (Participant 35).*

Interestingly, some of the reflections above imply that teachers' satisfaction with the outcomes of the new teaching practice ultimately built on their perception of students' satisfaction. In fact, in half of teachers these comments built on how far students did or did not like the new methodology, as if there was a structural interplay between them:

> *What I most **like** is that they [students] tell me that they **like** this way of working and notice that they learn a great deal. They **like** the connection with reality very much… (Participant 27).*

Moreover, and as suggested by the three-dimensional typology, these reflections also suggest that the evolution of TBs was more influenced by teachers' perception of students' satisfaction than by that of students' actual learning. Indeed, more than half of them linked their positive evaluation of the outcomes to how far students did or did not like the new methodology. Most of them did so without even mentioning students' learning, as did participant 3: 'students loved the method, the experience, [and] the same thing happened to me'. The rest turned to both students'

satisfaction and their learning but implying the prevalence of the former over the latter, as participant 54 did by stating that her opinion was 'as follows: 1st students loved it; 2nd they achieved the objectives; and 3rd their participation increased'. In contrast, teachers turning to students' learning as more important than their satisfaction, or with no reference to it, were a minority.

The increasing acceptance of TBL due to the interpreted outcomes summarised above led teachers to re-assess the conclusions drawn from its implementation over the course of the CPD programme (arrow 9). For example, the beliefs about teamwork in some teachers were negative and acted as an obstacle for the intended change at the beginning, but they became a facilitator in the light of the outcomes of piloting TBL. This becomes clear in the use of opposed sentiment words as far as the programme progressed. The written reflections of participant 2 before and after year 1 are a case in point, as the changes in beliefs during year 1 would inform her re-assessment of teamwork during year 2:

> *I have been **reluctant** to work cooperatively because the evaluation seemed entirely **unfair** to me...*
>
> *It has been **enriching** for students… I was **happy** to observe that some students have **increased** their level of involvement as the TBL lessons have been taking place...*

This ongoing re-assessment, in reinforcing the conclusion that the outcomes of the new practice were desirable, led some teachers to persist with the experimentation by extending TBL beyond the CPD programme or even by adopting it (arrow 10), which suggests a durable, non-superficial adaptive change in TBs:

> *I´m really **eager** to continue this professional development [beyond year 2] (participant 54).*
>
> *In short, TBL can be a **useful** tool to **improve** the quality of learning and should be promoted not only in the baccalaureate but also at earlier stages… (participant 40).*
>
> *I am **interested** in continuing to create more TBL lesson plans [after year 2], including in other subjects (participant 12).*

6.7.3 The association of factors with subgroups of teachers

We did not find any relevant association of factors with gender and discipline, as all of them acted as obstacles to, or facilitators for, the intended change in TBs in all subgroups of teachers similarly. However, a nuance concerning type of schooling and teaching experience might be worth highlighting. Prior TBs in vocational education teachers were experienced more as a relevant facilitator, whereas in baccalaureate teachers they acted more as relevant obstacles. Teachers' reflections suggest that this is so because the former were more consistent than the latter with the intended change. Moreover, less experienced teachers were more negatively influenced by the factors of the domain of practice for two reasons. Firstly, the prevalence of the difficulty of designing TBL lesson plans as a relevant obstacle decreased in inverse proportion to years of experience: from 45% (1-6 years of experience) to 27% (7-18 years), and to 9% (over 18 years). Moreover, the proportion of teachers with 1-6 years of experience considering classroom management with the new teaching practice as an important obstacle (45%) doubled that of the rest of teachers (20%). Conversely, they were more positively influenced by the outcomes of the new practice in terms of students´ learning (content assimilation and development of skills), as the proportion of teachers with 1-6 years of experience considering it as a relevant facilitator doubled that of the rest of teachers (72% and 36% respectively).

6.8 Conclusion

This study addresses a gap in research, making empirical and conceptual contributions to the fields of teachers' beliefs, professional development, and educational change. To our knowledge, it is the first generally oriented, longitudinal study of no small scale that delves into the complex dynamics of factors shaping the evolution of the beliefs about teaching of in-service teachers in response to long-term, compulsory CPD, and it does so from an `ecological´ approach within a context of official educational change demands with insufficient teacher support.

Our three-dimensional taxonomy provides an exhaustive list of 28 influential factors, suggesting the relevance of some traditionally overlooked by the literature on teachers' beliefs that deserve

further exploration, such as the difficulty of the pre-class lesson planning phase of teaching and students' resistance to new teaching practices, which in turn appears to prevail over their actual learning. Moreover, it classifies these factors from an innovative approach that could inform future research, providing a sort of map that deepens our understanding of their multifaceted nature by considering three perspectives simultaneously: the domain of professional growth in which they occur, the strength of their influence, and their character as facilitators for, or obstacles to, the intended change in TBs. The taxonomy aligns with the features of effective CPD highlighted by reviewers (e.g., Darling-Hammond et al., 2017) and suggests that providing teachers with operational teaching methods directly implementable in the classroom with sustained and personalised support is critical. We found that, while the picture provided by this taxonomy does not vary significantly according to subgroups of teachers, the form in which its factors influence the evolution of teachers' TBs appear to change according to teaching experience, supporting scholars who contend that the more teaching experience, the more predisposition to constructivist TBs (Arancibia et al. (2020). Moreover, it is true that leadership styles may influence teachers' commitment and performance in CPD (e.g., Day, 1999), but the only influential factor directly related to leadership in our taxonomy (school organisation) represented and obstacle of some relevance only.

The 4 overarching patterns uncovered in the interaction between the factors shaping change in TBs through the implementation of the IMTPG are consistent with the three-dimensional taxonomy. The change sequence points just to situational change, but the 3 growth networks hint at professional growth and more durable change in teachers' TBs. The change sequence found between TBs and the CPD programme supports the centrality of sustained and personalised support for effective CPD mentioned above. It also algins with scholars highlighting prior beliefs as a factor filtering teachers' response to CPD (e.g. Fives & Buehl, 2012) and suggests that the degree of consistence between prior TBs and the TBs underpinning the new teaching approach influences belief change not only in prospective teachers (Dang et al., 2024) but also in-service teachers. This explains the different response to the CPD

programme between teachers in different types of Spanish post-obligatory, secondary school settings (vocational education and baccalaureate).

The identification of designing lesson plans as a relevant obstacle to the intended change in TBs included in growth network 1 suggests that the discrepancy between professed and enacted beliefs highlighted by the literature (e.g., Lane & Ní Ríordáin, 2020) already begins in the pre-class phase of teachers' activity. This implies that the transformative power of educational change efforts based on CPD might well be already lost in the planning phase of teaching, thus supporting the appropriateness of professional development approaches emphasising the importance of lesson planning, such as Lesson Study (e.g., Bucher et al., 2026) and Instructional coaching (e.g., Knight, 2017). Growth network 2 provides empirical evidence of the reciprocal influence between TBs and classroom practice, thus supporting the suitability of theoretical frameworks assuming a cyclical rather than a linear approach to teacher growth (e.g., Richardson, 1996). The analysis includes a rich array of influential factors that allows to understand when and how classroom practice facilitates or inhibits change in TBs and the other way round, accounting for their complex relationship.

Growth network 3 provides initial empirical evidence suggesting that the evolution of teachers' TBs in response to transformative CPD depends more on their perception of students' experience with new teaching practices than on that of students' actual learning, which is also suggested by the three-dimensional taxonomy. This possible prevalence of teachers' perception of students' satisfaction over that of their learning as influential factor is new within the field of teachers' beliefs and appears to be consistent with scholars contending that 'student engagement has been generally considered an essential predictor of student learning' (Xu et al., 2023, p.1) and highlighting that teachers tend to misinterpret engagement as learning (Fredricks et al., 2004; Nuthall, 2007). However, the findings of this study suggest that this is not necessarily the case, since all the participants distinguishing both aspects in their reflections also implied the priority of the former over the latter. This supports scholars cautioning that, although student enjoyment and positive classroom experience may be desirable educational outcomes, the

fundamental question should be whether students have actually learned something (Hattie, 2012; Carini et al., 2006).

Taking ‘a flexible approach to the use of models’ of professional growth (Boylan et al., 2018, p. 121), we found empirical evidence supporting the adaptation of Clarke & Hollingsworth’s (2002) IMTPG as analytical tool for understanding the evolution of TBs in real-world situations with some refinements that have not yet been considered by the literature: a) the reconceptualization of ‘reflection’ as a change mediator encompassing the emotional domain, as well as the inclusion of sentiment lexicons in its analysis; and b) the conceptualisation of ‘re-evaluation’ as a change mediator in its own right that is distinct from reflection or enaction and links the personal domain to the other 3 (not only that of consequence). This interpretation aligns with scholars contending a post-cognitivist approach to belief development (e.g., Gill & Hardin, 2015), showing how the IMTPG could account for the role of emotions in belief change and thus be considered in the comparative analysis of the effectiveness of theoretical models in accounting for belief change recently claimed by reviewers for future research on teachers’ beliefs (Wang et al., 2024).

This study also allows us to make some recommendations for policy and practice. The three-dimensional typology and the dynamics of factors uncovered strongly suggest both the virtual irrelevance of the education law seeking reform and the prominence of the CPD programme as factors influencing the evolution of teachers’ TBs. They also show the existence of more, stronger facilitators for than obstacles to the intended change, suggesting that teachers are more responsive than resistant to develop their TBs. Accordingly, we urge policy makers and administrators to make the most of this predisposition and help teachers to become familiar and confident with the intended educational change by pairing transformative educations laws with sustained, long-term teacher professional development. More particularly, we recommend them fostering, supporting, and harnessing local CPD initiatives which provide teachers with operational methodologies helping them to pilot the competence-led approach sought.

Moreover, based on the three-dimensional typology, the change sequence, and the 3 growth networks found in this study, we encourage teacher educators committed to educational change to focus on the development of TBs, fostering the design and implementation of bespoke CPD initiatives sustained over time, as most research recommends (e.g., Opfer & Pedder, 2011). More particularly, we recommend them developing programmes that promote the piloting of operational methodologies by blending an initial, experiential approach to the new teaching practice with personalised support. This support assists them to address the obstacles found not only in classroom practice, but also in the pre-class phase of teaching that guides this practice. In this sense, we recommend considering the suitability of approaches that assume lesson planning as an essential component of teacher professional growth, such as Instructional Coaching (Knight, 2017; Kraft & Hill, 2020), Lesson Study (Bucher et al., 2026; Lewis et al., 2019), Professional Learning Communities (DuFour & Eaker, 1998; Stoll et al., 2006), and Reflective Practice (Farrell, 2018; Schön, 1992).

Finally, it is true that taking students' experience into account 'yields a deeper understanding of the effectiveness of teaching practices' (Wullschleger et al., 2025). However, given the possible prevalence of teachers' perception of students' satisfaction with the new teaching practice over that of students' learning as a factor influencing belief change, we recommend teacher educators paying special attention to helping teachers to base their assessment of the new practice not just on students' satisfaction but also on their learning gains.

6.9 List of references

Anney, V. N. (2015). Ensuring the Quality of the Findings of Qualitative Research: Looking at Trustworthiness Criteria. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS)*, *5*(2), 272–281.

Arancibia, M. L., Cabero, J., & Marín, V. (2020). Análisis factorial de una escala de creencias sobre la enseñanza y su relación con características personales y profesionales de docentes de Educación Superior. *Revista Espacios*, *41*, 25–31. https://es.revistaespacios.com/a20v41n02/20410225.html

Arora, A. G., Kean, E., & Anthony, J. L. (2000). An interpretive study of a teacher's evolving practice of elementary school science. *Journal of Science Teacher Education*, 11(2), 155–172. https://doi.org/10.1023/A:1009472909785

Ashton, P., & Gregoire-Gill, M. (2003). At the Heart of Teaching. The Role of Emotion in Changing Teachers' Beliefs. In J. Raths & A. McAninch (Eds*.), Teacher Beliefs and Classroom Performance: The Impact of Teacher Education* (pp. 99–122). Information Age.

Ashton, P. T. (2015). Historical overview and theoretical perspectives of research on teachers' beliefs. In H. Fives & M. G. Gill (Eds.), *International Handbook of Research on Teachers' Beliefs* (pp. 31–47). Routledge.

Bächler, R., Pozo, J., & Scheuer, N. (2018). How do teachers conceive the role of emotions in teaching and learning? An analysis of the affective component of their beliefs. *Infancia y Aprendizaje*, 41(4), 733–793. https://doi.org/10.1080/02103702.2018.1518078

Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher*, *33*(8), 3–15. https://doi.org/10.3102/0013189X033008003

Boylan, M., Coldwell, M., Maxwell, B., & Jordan, J. (2018). Rethinking models of professional learning as tools: a conceptual analysis to inform research and practice. *Professional Development in Education*, *44*(1), 120–139. https://doi.org/10.1080/19415257.2017.1306789

Bucher, J., Kager, K., Kim, J., & Vock, M. (2026). Lesson Study in its original context: exploring Japanese teachers' perspectives on an export hit of the Japanese education system. *Professional Development in Education*. https://doi.org/10.1080/19415257.2026.2682240

Buehl, Mi., & Beck, J. (2015). The relationship between teachers' beliefs and teachers' practices. In H. Fives & M. Gill (Eds.), *International Handbook of Research on Teachers' Beliefs* (pp. 66-84). Routledge.

Cady, J. A., Meier, S. L., & Lubinski, C. A. (2006). Developing mathematics teachers: The transition from preservice to experienced teacher. *Journal of Educational Research*, 99(5), 295–306. https://doi.org/10.3200/JOER.99.5.295-306

Carini, R. M., Kuh, G. D., & Klein, S. P. (2006). Student engagement and student learning: Testing the linkages. *Research in Higher Education*, *47*(1), 1–32. https://doi.org/10.1007/s11162-005-8150-9

Cheung, A., & Hennebry-Leung, M. (2023). Exploring an ESL teachers' beliefs and practices of teaching literary texts: A case study in Hong Kong. *Language Teaching Research*, 27(1), 181-206. https://doi.org/10.1177/1362168820933447

Chung, E. (2018). Revisiting Second Language Vocabulary Teaching: Insights from Hong Kong In-Service Teachers. *Asia-Pacific Education Researcher*, 27(6), 499–508. https://doi.org/10.1007/s40299-018-0412-3

Chung, E. (2022). *Effecting Change in Teachers' Epistemological and Pedagogical Beliefs about Vocabulary Learning and Teaching: The Role of Dialogic Reflection*. Sage Open, 12(1). https://doi.org/10.1177/21582440211071084

Clarke, D., & Hollingsworth, H. (2002). Elaborating a model of teacher professional growth. *Teaching and Teacher Education*, 18(8), 947–967. https://doi.org/10.1016/S0742-051X(02)00053-7

Clore, G. L., & Palmer, J. (2009). Affective guidance of intelligent agents: How emotion controls cognition. *Cognitive Systems Research*, 10(1), 21–30. https://doi.org/10.1016/j.cogsys.2008.03.002

Dang, T. V. A., Haworth, P., & Ashton, K. (2024). Pre-service teachers' belief changes in an English for specific purposes teacher education context. *English for Specific Purposes*, 73, 110–123. https://doi.org/10.1016/j.esp.2023.10.009

Darby, S., O'Hanlon, D., Casterton, S., Harding, N., O'Brien, A. M., Quinn, G., Urmeneta, O., & Tweddell, S. (2023). Improved learning outcomes and teacher experience: A qualitative study of team-based learning in secondary schools. *Social Sciences and Humanities Open*, *8*(1). https://doi.org/10.1016/j.ssaho.2023.100590 (Self-reference)

Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017*). Effective teacher professional development*. Learning policy institute. Retrieved 12 September 2024 from https://files.eric.ed.gov/fulltext/ED606743.pdf

Day, C. (1999). *Developing Teachers: The Challenges of Lifelong Learning*. London: Falmer Press.

Dewey, J. (1910). *How we think*. Boston: Heath & Co. (Republished as an unabridged replication by Dover Publications, Toronto, in 1997).

Dip, J. A., & Silenzi, M. I. (2024). Empirical application of sentiment analysis and emotions in Spanish: A post-cognitivist approach. *Training,Language and Culture, 8*(2), 52-65. https://doi.org/10.22363/2521-442X-2024-8-2-52-65

DuFour, R., & Eaker, R. (1998). Professional Learning Communities at Work: Best Practices for Enhancing Student Achievement. Bloomington: Solution Tree Press

Egloff, F., & Souvignier, E. (2020). Effects of Emotion on Teaching-Related Beliefs, Attitudes, and Intentions of Preservice Teachers. *Psychology Learning and Teaching*, 19(2), 161–183. https://doi.org/10.1177/1475725719868410

Elliott, V. (2018). Thinking about the coding process in qualitative data analysis. *Qualitative Report*, 23(11), 2850–2861. https://doi.org/10.46743/2160-3715/2018.3560

Farrell, T. S. C. (2018). *Research on Reflective Practice in TESOL*. Abingdon: Routledge.

Fives, H., Barnes, N., Chiavola, C., SaizdeLaMora, K., Oliveros, E., & Mabrouk-Hattab, S. (2019). Reviews of Teachers' Beliefs. *Oxford Research Encyclopedia of Education*. Retrieved 27 Sep. 2024, from https://oxfordre.com/education/view/10.1093/acrefore/9780190264093.001.0001/acrefore-9780190264093-e-781.

Fives, H., & Buehl, M. (2012). Spring cleaning for the "messy" construct of teachers' beliefs: What are they? Which have been examined? What can they tell us? *Educational Psychology Handbook*, Vol 2, 471–499. https://doi.org/10.1037/13274-019

Frijda, N. H., & Mesquita, B. (2000). Beliefs through emotions. In N. H. Frijda, A. S. R. Manstead, & Sacha Bem (Eds.), *Emotions and beliefs: How feelings influence thoughts* (pp. 45–77). Cambridge University Press Cambridge, UK.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). “School Engagement: Potential of the Concept, State of the Evidence.” *Review of Educational Research*, *74*(1), 59–109. https://doi.org/10.3102/00346543074001059

García-Gómez, S., & Gil Flores, J. (2022). El Profesorado y los Enfoques Innovadores en Centros de Educación Secundaria en España. *Archivos Analíticos de Políticas Educativas*, 30(167). https://doi.org/https://doi.org/10.14507/epaa.30.7419

Garner, J. K., & Kaplan, A. (2021). A complex dynamic systems approach to the design and evaluation of teacher professional development. In K. J. Strom, T. Mills, & L. Abrams (Eds.), *Non-Linear Perspectives on Teacher Development*. London: Routledge. https://doi.org/10.1080/19415257.2021.1879231

Gill, M., & Hardin, C. (2015). A “hot” mess: Unpacking the relation between teachers’ beliefs and emotions. In H. Fives & M. Gill (Eds.), *International handbook of research on teachers’ beliefs* (pp. 230–246). Routledge.

Girardet, C. (2018). Why do some teachers change and others don’t? A review of studies about factors influencing in-service and pre-service teachers’ change in classroom management. *Review of Education*, 6(1), 3–36. https://doi.org/10.1002/rev3.3104

Glaser, B. G., & Strauss, A. L. (2017*). The discovery of grounded theory: Strategies for qualitative research* (1st ed.). Routledge.

Gläser, J., & Laudel, G. (2013). Life with and without coding: Two methods for early-stage data analysis in qualitative research aiming at causal explanations. *Forum Qualitative Sozialforschung*, 14(2). https://doi.org/10.17169/fqs-14.2.1886

Guskey, T. R. (2002). Professional development and teacher change. *Teachers and Teaching: Theory and Practice*, *8*(3), 381–391. https://doi.org/10.1080/135406002100000512

Harvey, M., Baumann, C., & Fredericks, V. (2019). A taxonomy of emotion and cognition for student reflection: introducing emo-cog. *Higher Education Research and Development*, *38*(6), 1138–1153. https://doi.org/10.1080/07294360.2019.1629879

Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning*. Routledge.

He, Y., Levin, B. B., & Li, Y. (2011). Comparing the content and sources of the pedagogical beliefs of Chinese and American pre-service teachers. *Journal of Education for Teaching*, 37(2), 155–171. https://doi.org/10.1080/02607476.2011.558270

Hoffman, B. H., & Seidel, K. (2015). Measuring Teachers’ Beliefs: For What Purpose? In H. Fives & M. Gill (Eds.), *International handbook of research on teachers’ beliefs* (pp. 106–127). Routledge.

Hrynchak, P., & Batty, H. (2012). The educational theory basis of team-based learning. *Medical Teacher*, 34(10), 796–801. https://doi.org/10.3109/0142159X.2012.687120

Huberman, M. (1992). Understanding teacher development. In A. Hargreaves & M. G. Fullan (Eds.), *Teacher development and instructional mastery* (pp. 122–142). Cassell.

Knight, J. (2017). *The impact cycle: What instructional coaches should do to foster powerful improvements in teaching*. Thousand Oaks: Corwin Press.

Kraft, M. A., & Hill, H. C. (2020). Developing Ambitious Mathematics Instruction Through Web-Based Coaching: A Randomized Field Trial. In *American Educational Research Journal, 57(6*), 2378-2414. https://doi.org/10.3102/0002831220916840

Kubitz, K. (2014). The evidence, Please. In J. Sibley & P. Ostafichuk (Eds.), *Getting started with team-based learning*. Stylus Publishing.

Lane, C., & Ní Ríordáin, M. (2020). Out-of-Field Mathematics Teachers' Beliefs and Practices: an Examination of Change and Tensions Using Zone Theory. *International Journal of Science and Mathematics Education*, *18*(2), 337–355. https://doi.org/10.1007/s10763-019-09964-5

Langelaan, B. N., Gaikhorst, L., Smets, W., & Oostdam, R. J. (2024). Differentiating instruction: Understanding the key elements for successful teacher preparation and development. In *Teaching and Teacher Education* (Vol. 140). Elsevier Ltd. https://doi.org/10.1016/j.tate.2023.104464

Levin, B. (2015). The development of teachers' beliefs. In H. Fives & M. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 48–65). Routledge.

Levin, B., & He, Y. (2008). Investigating the content and sources of preservice teachers' personal practical theories. *Journal of Teacher Education*, 59(1), 55–68. https://doi.org/10.1177/0022487107310749

Levin, B., He, Y., & Allen, M. (2013). Teacher Beliefs in Action: A Cross-Sectional, Longitudinal Follow-Up Study of Teachers' Personal Practical Theories. *Teacher Educator*, 48(3), 201–217. https://doi.org/10.1080/08878730.2013.796029

Lewis, C., et al. 2019. How does Lesson Study work? Toward a theory of Lesson Study process and impact. In: R. Huang, A. Takahashi, and J.P. Da Ponte, eds. *Theory and practice of Lesson Study in mathematics*. Cham: Springer International Publishing, 13–37

Li, L., & Huang, J. L. (2023). Exploring preservice teachers' belief changes during early childhood education teaching practicum in China: A case study. *Asia Pacific Journal of Education*. https://doi.org/10.1080/02188791.2023.2167806

Lincoln, Y. S., & Guba, E. G. (1986). But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Program Evaluation*, *1986*(30), 73–84. https://doi.org/10.1002/ev.1427

Liu, B. (2020). *Sentiment Analysis.Mining Opinions, Sentiments, and Emotions* (Second Edition). Cambridge University Press.

LOMLOE (2020). *Spanish Official State Gazette*, 340, of 30 December 2020, pages 122868 to 122953. https://bit.ly/3ra9FIr

López Rupérez, F. (2022). El enfoque del currículo por competencias. Un análisis de la LOMLOE. *Revista Española de Pedagogía*, 80(281). https://doi.org/10.22550/rep80-1-2022-05

MINEDUC (2024). *Las cifras de la educación en España*. Curso 2021-2022. Retrieved 25 September 2024, from https://www.educacionfpydeportes.gob.es/servicios-al-ciudadano/estadisticas/indicadores/cifras-educacion-espana/2021-2022.html

Michaelsen, L. K., & Sweet, M. (2008). The essential elements of team-based learning. *New Directions for Teaching and Learning*, 2008(116), 7–27. https://doi.org/10.1002/tl.330

Mohammad, S., & Turney, P. (2010, June 5). Emotions evoked by common words and phrases: Using mechanical Turk to create an emotion lexicon. In *Proceedings of the NAACL-HLT 2010 Workshop on Computational Approaches to Analysis and Generation of Emotion in Text* (pp. 26-34). The Association for Computational Linguistics.

Mohammad, S. M., & Turney, P. D. (2013). Crowdsourcing a word-emotion association lexicon. *Computational Intelligence, 29*(3), 436-465. https://doi.org/10.1111/j.1467-8640.2012.00460.x

Mohammad, S. M., & Turney, P. D. (2024). NRC word-emotion association lexicon. *Saif Mohammad.* https://saifmohammad.com/WebPages/NRC-Emotion-Lexicon.htm

Monarca, H., & Rappoport, S. (2013). Investigación sobre los procesos de cambio: El caso de las competencias básicas en España. *Revista de Educación*, 54–78. https://doi.org/10.4438/1988-592X-RE-2013-EXT-256

Nelson, M.; Tweddell, S. (2017). Leading academic change: experiences of academic staff implementing team-based learning. *Student Engagement in Higher Education Journal*, 1(2), 100–116. https://doi.org/10.1093/bjsw/bcs140.

Nespor, J. (1987). The role of beliefs in the practice of teaching. *Journal of Curriculum Studies*, 19(4), 317–328. https://doi.org/10.1080/0022027870190403

Nuthall, G. (2007). *The hidden lives of learners*. NZCER Press.

OECD (2019). *OECD Future of Education and Skills 2030: OECD Learning Compass 2030. A series of concept notes*. OECD Publishing. https://www.oecd.org/education/2030-project/contact/OECD_Learning_Compass_2030_Concept_Note_Series.pdf

Onwuegbuzie, A. J., & Leech, N. L. (2007). Validity and qualitative research: An oxymoron? *Quality and Quantity*, *41*(2), 233–249. https://doi.org/10.1007/s11135-006-9000-3

Opfer, V. D., & Pedder, D. (2011). Conceptualizing teacher professional learning. In *Review of Educational Research* (Vol. 81, Issue 3, pp. 376–407). SAGE Publications Inc. https://doi.org/10.3102/0034654311413609

Ortony, A., Norman, D. A., & Revelle, W. (2005). Affect and Proto-affect in Effective Functioning. In J. M. Fellous & M. A. Arbib (Eds.), *Who needs emotions: The brain meets the machine* (pp. 173–202). Oxford University Press.

Parsons, S. A., Hutchison, A. C., Hall, L. A., Parsons, A. W., Ives, S. T., & Leggett, A. B. (2019). U.S. teachers' perceptions of online professional development. *Teaching and Teacher Education*, *82*, 33–42. https://doi.org/10.1016/j.tate.2019.03.006

Peck, C., & Herriot, L. (2015). Teachers' beliefs about social studies. In H. Fives & M. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 399–414). Routledge.

Pradhan, A., Senapati, M. R., & Sahu, P. K. (2023). Comparative Analysis of Lexicon-Based Emotion Recognition of Text. In R. Doriya, B. Soni, A. Shukla, & XZ. Gao (Eds.), *Machine Learning, Image Processing, Network Security and Data Sciences* (pp. 671–677). Springer. https://doi.org/10.1007/978-981-19-5868-7_49

Prats, E., Marín-Blanco, A., & Álvarez-López, G. (2019). Elementos para el debate en la iniciación profesional docente en España. In *La iniciación profesional docente: marcos supranacionales y estudios comparados* (pp. 204–220).

Roberson, B., & Franchini, B. (2014). The Emotional Journey to Team-Based Learning. In J. Sibley & P. Ostafichuk (Eds.), *Getting started with team-based learning*. Stylus Publishing. http://solo.bodleian.ox.ac.uk/OXVU1:LSCOP_ALL:oxfaleph000815488

Rodríguez-García, A., & Arias-Gago, A. R. (2022). Bibliometric characteristics of the international literature on teaching methods: a cross-disciplinary taxonomy. *Revista Complutense de Educacion*, 33(1), 93–106. https://doi.org/10.5209/RCED.73722

Saldaña, J. (2021). *The coding manual for qualitative researchers* (4th ed.). Thousand Oaks, CA: Sage.

Schön, D.A. (1992). The Reflective Practitioner: How Professionals Think in Action (1st ed.). Routledge. https://doi.org/10.4324/9781315237473

Schraw, G., & Olafson, L. (2015). Assessing teachers' beliefs. In H. Fives & M. Gill (Eds.), *International Handbook of Research on Teachers' Beliefs* (pp. 87–105). Routledge

Sims, S., & Fletcher-Wood, H. (2021). Identifying the characteristics of effective teacher professional development: a critical review. *School Effectiveness and School Improvement*, *32*(1), 47–63. https://doi.org/10.1080/09243453.2020.1772841

Siwatu, K. O., & Chesnut, S. R. (2015). The career development of preservice and inservice teachers why teachers' self-efficacy beliefs matter. In H. Fives & M. Gill (Eds.), *International Handbook of Research on Teachers' Beliefs* (pp. 212–229). Routledge.

Skott, J. (2015). The promises, problems, and prospects of research on teachers' beliefs. In H. Fives & M. Gill (Eds.), *International Handbook of Research on Teachers' Beliefs* (pp. 37–54). Routledge.

Spencer, L., Ritchie, J., O'Connor, W., Morrell, G., & Ormston, R. (2014). Analysis in practice. In J. Ritchie, J. Lewis, C. M. Nicholls, & R. Ormston (Eds.), *Qualitative research practice: A guide for social science students and researchers* (2nd ed., pp. 295–345). SAGE.

Starkey, L., Yates, A., Meyer, L. H., Hall, C., Taylor, M., Stevens, S., & Toia, R. (2009). Professional development design: Embedding educational reform in New Zealand. *Teaching and Teacher Education*, *25*(1), 181–189. https://doi.org/10.1016/j.tate.2008.08.007

Stoll, L., Bolam, R., McMahon, A., Wallace, M., & Thomas, S. (2006). Professional Learning Communities: A Review of the Literature. *Journal of Educational Change*, *7*(4), 221–258. https://doi.org/10.1007/s10833-006-0001-8

Swan, M., & Swain, J. (2010). The impact of a professional development programme on the practices and beliefs of numeracy teachers. *Journal of Further and Higher Education*, *34*(2), 165–177. https://doi.org/10.1080/03098771003695445

Thompson, A. G. (1992). Teachers' beliefs and conceptions. In D. Grouws (Ed.), *Handbook of research on mathematics teaching and learning* (pp. 127–146). Macmillan Publishing Co, Inc.

Tschannen-Moran, S. N. M., & Um, S. N. (2015). Context Matters: The Influence of Collective Beliefs and. In H. Fives & M. Gill (Eds.), *International Handbook of Research on Teachers' Beliefs* (pp. 313–328). Routledge.

Wang, X., Gao, Y., Sun, F., & Wang, Q. (2024). Unveiling the tapestry of teacher belief research: tracing the present and forging the future through bibliometric analysis. *Current Psychology*, *43*(17), 15659–15672. https://doi.org/10.1007/s12144-023-05546-5

Watt, H. M. G., & Richardson, P. W. (2015). A motivational analysis of teachers' beliefs. In H. Fives & M. Gill (Eds.), *International Handbook of Research on Teachers' Beliefs* (pp.191–211). Routledge.

Wullschleger, A., Maag Merki, K., Grob, U., Rechsteiner, B., Compagnoni, M., & Vörös, A. (2025). Teacher collaboration to elevate student achievement? *Learning and Instruction*, *97*. https://doi.org/10.1016/j.learninstruc.2025.102104

Yorks, L., & Kasl, E. (2002). Toward a theory and practice for whole-person learning: reconceptualizing experience and the role of affect. In *Adult Education Quarlerly 52*(3), 176-192. https://doi.org/10.1177/07417136020523002

Xu, X., Shi, Z., Bos, N. A., & Wu, H. (2023). Student engagement and learning outcomes: an empirical study applying a four-dimensional framework. *Medical Education Online*, *28*(1), 1-12. https://doi.org/10.1080/10872981.2023.2268347

Zubiri, X. (1980). *Inteligencia sentiente. Inteligencia y realidad.* Madrid: Alianza Editorial.

Zubiri, X. (1982). *Inteligencia y logos*. Madrid: Alianza Editorial.

Zubiri, X. (1983). *Inteligencia y razón*. Madrid: Alianza Editorial.

Zubiri, X. (1999). *Sentient Intelligence*. The Xavier Zubiri Foundation of North America. https://doi.org/10.7551/mitpress/7415.003.0026

7. Discussion and conclusions

As a teacher educator strongly committed to an official school reform towards constructivism within a context of insufficient administrative support, I faced a problem of practice: to understand how far the bespoke CPD programme designed by me to enable secondary teachers of my institution to experience the advantages of a constructivist pedagogy succeeded in helping them develop their TBs as a means for a sustainable change in their teaching practices. An initial review of the literature showed that this problem of practice was also a research problem worth exploring because, while the development of in-service teachers' TBs is a necessary requirement for educational change, their evolution in response to CPD remains virtually unexplored from a generally oriented perspective. The previous sections of this thesis including 3 articles address this research problem and this gap in research. This section discusses the findings included in the 3 articles and draws the final conclusions. I first outline the main constraints of the study limiting the scope of its findings. Then, I discuss its methodological and empirical contributions. Finally, I make some recommendations for future research and for teacher educators in the light of both the limitations and the contributions.

7.1 Limitations

The main limitations of this study concern the nature of TBs, the authenticity of teachers' reports, the influence of school leadership, the implications of my position, and the institutional culture of the school federation.

Firstly, it is true that my endeavour to understand the evolution of teachers' TBs in response to CPD overcomes some of the main weaknesses identified by reviewers of research into the development of teachers' beliefs (Levin, 2015): a) it meets the acute need for longitudinal studies; b) its scale is by far much larger than the usual small-scale case studies including just 1-4 teachers; c) it transcends the prevailing focus on pre-service teacher education, tracking practising teachers at all career stages; d) it adopts a generally oriented rather than the generally domain-specific approach; and e) it tries to confront the elusory character of teachers' actual beliefs by transcending the predominantly self-reported nature of data. Nonetheless, this

inherently elusive nature of beliefs, which cannot be directly accessed but only indirectly inferred, along with my epistemological approach assuming that any intellectual effort apart from primordial apprehension is always positioned, limit the claims of this study. The combination of the three perspectives adopted in my analysis cannot give me access to teachers' true TBs for an objective description. Rather, it provides a positioned, mediated inference of how TBs might be that is interpretive by nature. In the same line, my understanding of the evolution of TBs from these 3 perspectives draws on the development of coding frameworks which, while carefully designed with the assistance of critical friends, when possible, require further exploration and validation.

Secondly, it is true that my multiple roles described throughout the thesis might have been advantageous in terms of the credibility of the findings, as stated in subsection 4.6.1 included in Article 1. The identification of a maladaptive profile made up of the 23.6% of teachers in Article 2, as well as the analysis of teachers' reflections conducted in Article 3 suggest that my `prolonged engagement´ (Lincoln & Guba, 1986) with participants and my personal support across the 2 academic years of school intervention most probably contributed to build the necessary trust, rapport, and confidence for participants to be authentic and realistic in their reports. However, the issue of social desirability bias is pervasive in research into teachers' beliefs based on self-reported data (Hoffman & Seidel, 2015), and the risk of inauthenticity in teachers' reports can only be minimised but not eliminated, particularly in the questionnaire.

Thirdly, headteachers played a role during the preparation and the implementation of the CPD programme, and this intervention represents a limitation of the study. The limitation entailed by their role in the preparation phase when selecting the potential participants appears to be weak. Indeed, Rogers' (2003) organisational development theory has been applied in higher education to technology adoption (e.g., Sahin, 2006) and to instructional change (Estis, 2017; Styron et al., 2015), but it is virtually unexplored in secondary schooling. Its implementation in the multi-stage educational effort framing the CPD programme addressed by this thesis might have led to a pre-existent bias in the headteachers' selection of potential participants as representatives of

the ‘early majority’. However, the findings suggest that headteachers failed to identify this ‘early majority’, as participants in the research appear to cover all the spectrum of attitudes towards innovation, rather than just teachers who are willing to innovate in the light of the outcomes of ‘innovators’ and ‘early adopters’. This minimises the significance of the possible impact of headteachers’ intervention on participants’ recruitment.

By contrast, the limitation entailed by their intervention during the implementation phase of the CPD programme seems stronger, as there is evidence that leadership styles can influence teachers’ commitment and performance during CPD (Day, 1999; Fullan, 2015; Harris & DeFlaminis, 2016). In this study, headteachers’ leadership style could fall into the influential factor “school organisation” that was identified in the three-dimensional typology developed in Article 3. It is true that this factor was experienced by participants as an obstacle of some relevance only. Yet, the specific evaluation of the possible influence of headteachers` leadership on participants’ performance, particularly on the number of reflections and lesson plans shared during the programme and considered in the coding frameworks aimed at uncovering the development of TBs, was beyond the scope of this study. The difficulty of minimising the impact of this constraint becomes clearer when considering that, as it happens in real educational settings, several of the 11 schools changed their headteachers during the school intervention due to personal circumstances of headteachers, to the sustained institutional leadership renewal process, or to *ad hoc* decisions made by the federation’s Steering Committee for different reasons.

Fourthly, I was a researcher exploring my own practice in my own school federation. While this practitioner researcher position might have been beneficial and advantageous in some terms, such as the credibility of my interpretation mentioned earlier, it has proved to be very challenging in terms of validity. It is true that the steps taken to increase rigour and maximise trustworthiness that have been detailed in Article 1 (philosophical engagement and mixed journaling) minimised the possible influence of the conflicts that could derived from my possible personal and professional interests in the findings, but the possibility of this influence

can never be completely eliminated. Moreover, the epistemological advantages of this position enabled me to infer TBs from 3 different perspectives, but the nature of the CPD programme, as well as logistic and financial reasons prevented me from witnessing the perspective of participants' classroom practice, and thus from evaluating how far they succeeded in enacting the intended TBs that informed their lesson plans after my feedback. This would have provided an even more complete understanding of participants' response to the programme. Additionally, the duration of the programme, while unusually long both in in-service teacher education and within research into teachers' beliefs, allowed me to uncover changes and growth networks pointing to belief development only, rather than actual, durable belief development, which would require considering teachers' beliefs throughout their entire career (Fives & Buehl, 2012).

Finally, the findings of the study may be context-dependant, as the 55 participants belonged to 11 schools under the umbrella of the same Spanish state-sponsored federation. They might well share strong institutional values and pedagogical styles different from those of teachers in other institutions, in Spanish state schools, or in other countries.

7.2 Contributions

7.2.1 Methodological contributions

This thesis makes 4 contributions that could be of some value in methodological terms. Firstly, in engaging with philosophical considerations to provide my piece of practitioner research with rigour by exploring the consistency between ontology, epistemology, and methodology, I realised that Zubiri's philosophy (1980, 1982, 1983, 1999) provides an original approach allowing to underpin the use of mixed methods in an innovative way. As I showed in Article 1, his middle-ground ontology uncovering reality as 'otherness' or 'alterity' in our 'primordial apprehension' leads to question the very notion of research paradigms and the assumption that the issue of paradigm incommensurability is an insurmountable obstacle for mixed-method research (e.g., Beach & Kaas, 2020), thus providing scholars who consider it to be it a false problem (e.g. Pring, 2015) with a new ontological basis. My analysis of the potentiality of Zubiri's notion of reality to bolster the use of mixed methods without necessarily turning to

pragmatism or critical realism might well be informative for other researchers interested in mixing methods.

Secondly, my use of a digital research journal making the most of technology to record every single step of the research process and ensure traceability and 'retroductability' (Elliot, 2018; after Wodak, 2014) could be illuminating for other researchers struggling with issues of validity. Journaling has been proposed as a strategy to foster reflexivity in qualitative research at large (Lamb, 2013; Lichtman, 2023; Lincoln & Guba, 1985; Ortlipp, 2008) and in doctoral studies in particular (Corlett & Mavin, 2018; Meyer & Willis, 2019; Orange, 2016). It has also been recommended to increase confirmability (Wolf, 2003). However, Article 1 provides some evidence that a digital research journal can be used as a tool for increasing not only the confirmability, but also the transparency, transferability, and dependability of the findings, thus maximising trustworthiness.

Thirdly, the joint adoption of a person- rather than variable-centred perspective and Day's et al. (2008) synergetic approach in Article 2, apart from responding to the need for mixing multiple types of data and different analytical approaches when addressing belief development (Schraw & Olafson, 2015; Levin, 2015; Fives & Buehl, 2012), provides a holistic understanding of the complex influence of CPD on the evolution of TBs in every participant that is original within the field of teachers' beliefs. Moreover, this joint adoption allows to search for possible patterns grouping teachers with homogeneous profiles, which is a technique that has been explored when addressing TBs cross-sectionally (de Vries et al., 2013) but is innovative in longitudinal studies addressing belief development, and it can therefore enrich our understanding of the transformative power of in-service teacher education.

Finally, the adaptation of Clarke & Hollingsworth's (2002) IMTPG presented in Article 3 to understand the dynamics between the factors shaping the evolution of TBs in response to the CPD programme differs from that made by other researchers (da Ponte et al., 2022; Durak & Topçu, 2025; Justi & van Driel, 2006; Lebak, 2015; Lomas, 2018; Wongsopawiro et al., 2017; Zwart et al., 2007; Hartnett, 2011) in two ways that might be valuable in future research. Indeed,

the inclusion of the pre-class phase of teaching within the domain of practice, as well as the notion of 're-evaluation' as a change mediator distinct from 'enaction and 'reflection' that concerns all 4 domains represents a refinement of the IMTPG that could be helpful for other researchers. Moreover, the integration of Liu's (2020) aspect-based sentiment analysis into the IMTPG allows to uncover the emotional component of reflection and re-evaluation as mediators of belief change. This integration is in line with studies emphasising the role of emotions in adult learning (Yorks & Kasl, 2002; Harvey et al., 2019) and represents a possible response to the increasing need for post-cognitivist approaches accounting for the role of emotions in belief development (Gill & Hardin, 2015), which remains a glaring gap in research (Bächler et al., 2018; Cheung & Hennebry-Leung, 2020; Egloff & Souvignier, 2020). In this sense, this adaptation of the IMTPG might be worth considering for future researchers looking for 'hot' approaches to teacher belief change and professional growth.

7.2.2 Empirical contributions

This thesis aimed to understand the effectiveness of in-service teacher education by exploring how far a two-year CPD programme based on the promotion of a disruptive pedagogy called TBL succeeded in helping 55 Spanish teachers develop the intended, constructivist TBs. This general research problem was explored by addressing the following research questions:

1: How did teachers' TBs evolve in response to the two-year CPD programme?

2: How far did this evolution suggest the intended change in TBs, if at all?

3: What factors did influence the evolution of TBs during the programme?

4: How did these factors interact to facilitate or inhibit the intended change in TBs?

The findings support the inherently complex nature of teacher beliefs highlighted by the literature (Ashton, 2015; Fives & Buehl, 2012). Particularly, they suggest that the beliefs held by teachers about how their teaching practice should be or TBs are multifaceted and develop differently depending on the perspective taken for their elicitation, which entails that the more perspectives considered, the more nuanced and complete our understanding of their evolution in response to CPD. The picture provided by the 3 perspectives considered in Article 2 (reported,

implied, and enacted when planning lessons) is innovative in suggesting that this evolution follows 3 patterns, allowing to group teachers in 3 distinct profiles: a) effectively adaptive teachers, who had the intended TBs already before the CPD programme but experienced it very positively when transforming the lesson planning phase or their practice in a consistent way with the prospect of extending this new practice; b) reportedly adaptive teachers, who embraced the intended TBs but did not succeed in translating them into their practice when designing lesson plans, as if change in self-reported and implied TBs did not automatically lead to change in enacted TBs; and c) maladaptive teachers, who experienced the CPD programme negatively, reported and implied slightly maladaptive change in their TBs, and did not change the TBs enacted in their practice when planning lessons at all.

These 3 profiles suggest that the transformative power of CPD proved to be quite limited because, while the programme met the requirements usually listed in reviews of effective CPD (e.g., Fairman et al., 2023) in providing unusually long-term, timely, personalised support, the change provoked in TBs was effectively adaptive in one third of teachers only. It is true that participants belonging to the reportedly adaptive profile appeared to develop the conditions to move to the effectively adaptive one in further stages of the programme, but the occurrence of this progression across profiles would require further research and might well be inhibited by teachers' increasing disengagement from the programme over time.

The 3 profiles distinguished through cluster analysis in Article 2 point to the existence of 3 possible factors influencing the evolution of TBs in response to CPD: lesson planning, teaching inexperience, and previous beliefs. Firstly, in showing a degree of inconsistency between the different perspectives on TBs, the picture provided by the 3 profiles of teachers aligns with research emphasising the discrepancy between reported and enacted beliefs (Kaymakamoglu, 2017; Kane et al., 2002; Lane & Ní Ríordáin, 2020; Onurkan & Özer, 2017; Tang et al., 2012) and supports scholars contending that this discrepancy might be a piece of evidence of belief development (e.g., Buehl & Beck, 2015). What is more, this picture provides an innovative understanding of the complexity of change in TBs and thus of CPD effectiveness in suggesting

that this discrepancy starts before classroom practice when teachers enact their TBs in the lesson planning phase of teaching. This suggests that the loss of the transformative power of CPD referred to in the previous paragraph already happens in teachers' pre-class practice: the reportedly adaptive profile shows that almost half of teachers fail to enact in their lesson plans the change in TBs that they professed to have experienced, as if planning lessons for the new teaching practice was an obstacle for the intended change.

Secondly, the 3 profiles suggest a degree of association of the reportedly adaptive and maladaptive profiles with teaching experience, supporting that "the observation of more student-centred beliefs expressed by experienced teachers is a developmental pattern" (Levin, 2015, p. 58). This finding is consistent with Arancibia's et al. (2020a, p. 25) finding that teachers' "behavioural beliefs diminish as their teaching experience increases". The distribution of profiles across career stages suggests that the more teaching experience, the more adaptive evolution in TBs, as well as that the less teaching experience, the more maladaptive evolution, as if novice teachers were more resistant to the intended change. Finally, the 3 profiles support that the enaction of new TBs is more likely to occur in teachers whose constructivist orientation is predominant (e.g., Choi et al., 2023), and thus that previous TBs act as filters for the effectiveness of CPD (Kagan, 1992; Levin, 2015; Nespor, 1987; Pajares, 1992; Valckx et al., 2021).

The occurrence of these 3 aspects in the process of facilitating or inhibiting the intended change in TBs tangentially suggested by the 3 profiles uncovered in Article 2 is supported by the three-dimensional typology of factors developed through the thematic analysis of teachers' reflections in Article 3. This taxonomy identifies 28 influential factors, some of them ignored by the literature on teachers' beliefs, and it classifies them according to the domain of teacher professional activity, the relevance of their influence, and their character as obstacles to, or facilitators for, the intended TBs. Not surprisingly, the facilitators exerting the greatest influence concerned the CPD programme. It suggests that providing teachers with operational teaching methods directly transferable to the classroom with sustained, timely, personalised support is

critical, which aligns with the centrality of the support that teachers need to receive within contexts of school reform (e.g., Prats et al., 2019). Yet, interestingly, this taxonomy identifies previous TBs as a mixed factor (sometimes facilitator, sometimes obstacle) of great relevance, and both lesson planning and teaching inexperience always as obstacles of some relevance. The taxonomy also suggests that teachers' perception of students' satisfaction with the new classroom practice was more influential for the intended change than that of students' actual learning and skill development.

To my knowledge, this thesis pioneers the study on the complex dynamics between the factors shaping the evolution of TBs in response to long-term CPD from a generally oriented perspective. The findings yielded by the analysis drawing on the above-mentioned adaptation of the IMTPG suggest the existence of 1 change sequence and 3 growth networks that align and enrich the view on the influential factors tangentially suggested by the 3 profiles identified in Article 2 and then mapped in the three-dimensional typology. Besides the suitability of programmes meeting the features of effective CPD highlighted by the literature, such as sustained, timely, personalised support (Darling-Hammond et al., 2017; Langelaan et al., 2024; Fairman et al., 2023), the change sequence suggests the particular pertinence of providing teachers with really operational approaches which are perceived by them as directly applicable to their practice. This sequence, which points to situational, transitory belief change happening as far as teachers are participating in the programme, also supports the above-mentioned scholars contending that previous beliefs act as filters for the intended belief change, as it followed two patterns: some teachers highlighted the consistency between their previous TBs and those intended by the programme, as if the programme had reinforced the TBs that they already had, whereas others emphasised a degree of inconsistency, thus moving towards more constructivist TBs.

The 3 growth networks concern changes happening in several domains, thus suggesting more durable belief change pointing to possible belief development. The changes identified in growth networks 1 and 2 concern the personal domain and the domain of practice, as changes in

teachers' teaching practice involved changes in their TBs and the other way round. Growth network 1 supports the relevance of the pre-class phase of planning lessons as an obstacle to the intended change in TBs, as tangentially implied by the 3 profiles mentioned earlier: many participants emphasised the difficulties experienced during the CPD programme due to the inconsistency between their previous TBs and those underpinning the form of planning lessons for the new teaching practice, which led some of them to diminish the self-confidence in their skills for the intended practice and sometimes their commitment to the CPD programme. This finding of the importance of lesson planning for the transformative power of CPD is new within the field of teachers' beliefs and supports the particular suitability of professional development approaches emphasising the pre-class phase of teaching as an essential component of teacher professional growth, such as Instructional Coaching (Knight, 2017; Kraft & Hill, 2020), Lesson Study (Bucher et al., 2026; Lewis et al., 2019), Professional Learning Communities (DuFour & Eaker, 1998; Stoll et al., 2006), and Reflective Practice (Farrell, 2018; Schön, 1992).

Growth network 2 supports scholars contending that real educational change and effective CPD ultimately depend on teachers' lived experience in the face of the uncertainty provoked by the intended classroom practice (Fullan, 2015; Goodson, 2001; King & Stevenson, 2017; Lee & Yin, 2011; Louis, 2007; Sahlberg, 2006; Troman & Woods, 2000). The examples included in Article 3 provide empirical evidence of this, capturing how teachers' experience when piloting the new teaching practice in the classroom acted as a mixed factor, facilitating in some cases and hampering in others the development of the intended TBs, which in turn led teachers to increase their commitment to the new teaching practice or to give up piloting it.

Growth network 3 points to more durable change in TBs, as it concerns the personal domain, the domain of practice, and the domain of consequences. This network supports the particular relevance of teachers' perception of students' satisfaction with the new teaching practice and its prevalence over that of students' actual learning. It provides evidence that teachers' satisfaction with the outcomes of the new teaching practice overwhelmingly built on how far students did or did not like the new methodology, as if there was a structural interplay between them. This

finding is new for research into belief development and within the field of teachers' beliefs at large, and it supports scholars warning about teachers' tendency to mistake student engagement for student learning (Xu et al., 2023; Fredricks et al., 2004; Nuthall, 2007; Hattie, 2012; Carini et al., 2006; Wullschleger et al., 2025).

Finally, Article 3 suggests a degree of association between the factors identified in the three-dimensional typology and years of teaching experience. An analysis of how the influence of the 28 factors was distributed across Huberman's (1992) career stages in teacher development suggests that those concerning the domain of practice hampered the development of the intended TBs in novice rather than in experienced teachers, as if teaching inexperience was an obstacle to, or teaching experience a facilitator for, the intended change. Indeed, the prevalence of the difficulty of designing TBL lesson plans as a relevant obstacle decreased in inverse proportion to years of experience. Moreover, the amount of novice teachers considering classroom management with the new teaching practice as an important obstacle doubled that of more experienced teachers. This reinforces the possible relevance of years of teaching experience as influential factor already implied by the 3 profiles of teachers uncovered in Article 2, questioning that TBs become more and more robust "over time and use" (de Vries et al., 2014, p. 339; after Murphy & Mason, 2006; Pajares, 1992) due to the development of "actual routines" or "inertia" (Tang et al., 2012, p. 104).

In short, this thesis aimed to understand the effectiveness of in-service teacher education by addressing a gap in research. It provides initial empirical evidence about how TBs evolve in response to CPD from a generally oriented perspective by exploring the extent to which a multi-year programme based on the promotion of a disruptive pedagogy called TBL succeeded in helping 55 Spanish teachers develop constructivist TBs. The findings suggest that teachers' TBs evolved differently depending on the perspective adopted for their elicitation, and that this evolution followed 3 distinct patterns or profiles of teachers in their response to CPD: effectively adaptive, reportedly adaptive, and maladaptive. Only one third of teachers succeeded in effectively enacting the intended TBs when planning their lessons for the new teaching

practice despite the unusually sustained, timely, personalised nature of the programme. This suggests that the transformative power of CPD was largely lost in the pre-class lesson planning phase of teaching, before classroom practices. The picture provided by the 3 profiles in the evolution of TBs suggested the possible relevance of previous TBs, lesson planning, and teaching experience as factors facilitating and/or inhibiting the intended change in TBs. This relevance was supported by the three-dimensional typology of influential factors developed through the thematic analysis of teachers' reflections during the CPD programme, which, apart from mapping 28 factors, also suggests the relevance of teachers' perception of students' satisfaction with the new teaching practice and its prevalence over that of students' actual learning. An innovative analysis of the dynamics between all 28 factors following an adaptation of the IMTPG uncovered both situational and durable teaching belief changes in 1 change sequence and 3 growth networks. They provide evidence supporting the relevance of the influential factors implied by the 3 profiles and identified in the three-dimensional typology.

7.3 Recommendations

7.3.1 Recommendations for future research

It can be argued that this thesis represents a piece of evidence supporting the viability and suitability of the inclusive approach recommended by some scholars for future research within the field of teacher education (Mayer et al., 2017; Mayer & Oancea, 2021). Indeed, it strives to go beyond traditional indicators such as student outcomes to address the effectiveness of CPD by focusing on TBs. Moreover, while with important limitations, it harnesses the advantages of the practitioner researcher position to make the methodological and empirical contributions set out above. I would recommend scholars, administrators, and educational institutions insisting on this approach and promoting the consideration of teacher educators' perspective by providing practitioners with opportunities to engage in research and make the most of their privileged, uniquely rich position. This is particularly relevant when addressing in-service teacher education, given the difficulty of scholars to access CPD interventions in the way that practitioners can.

For teacher educators embarking on research, I would suggest exploring ways to address the issues of validity posed by their challenging position, such as journaling, and particularly digital, mixed journals. In this sense, research into how technology can help journaling not only to foster reflexivity and transparency, but also to maximise the trustworthiness of the findings by ensuring both traceability and 'retroductability' might be worthwhile for future practitioner researchers. Following Orange (2016), I also encourage supervisors to help doctoral students, particularly those conducting practitioner research, keep and structure digital journals that could help them to improve the trustworthiness of their research.

Regarding the inclusive approach and the focus on alternative indicators to better understand the effectiveness of teacher education and CPD, this thesis supports the suitability of addressing teachers' beliefs, and particularly the evolution of their beliefs about teaching. When doing so, I would propose considering the adoption of de Vries' et al. (2013, 2014) two-dimensional conceptualisation of TBs for 2 main reasons: a) it allows a more nuanced analysis of belief variation; and b) it allows to understand teacher growth as a less traumatic process of professional development which does not necessarily mean abandoning original beliefs but embracing new ones in a different balance between two belief dimensions. I would also suggest taking the possible suitability of post-cognitivist adaptations of Clarke & Hollingsworth's (2002) IMTPG into consideration. More specifically, I suggest evaluating the suitability of the approach adopted in this thesis, which integrates emotions into reflection and reevaluation as belief change mediators and applies Liu's (2020) aspect-based sentiment analysis to elicit them. Delving into this approach could contribute to filling the gap in research into the role of emotions in belief development.

Given the elusiveness of teachers' beliefs at large and the multi-faceted nature of TBs uncovered in this thesis, it seems highly advisable to elicit them from as many perspectives as possible, which reinforces the above-mentioned pertinence of helping teacher educators to become practitioner researchers to harness the richness of their position. In this sense, the combination of a person- rather than variable-centred perspective and Day's et al. (2008) synergetic approach

is original within the field of teacher beliefs and allows to uncover profiles of teachers according to the evolution of their TBs in response to CPD. The application of profiles to belief development in this thesis provides an innovative understanding of the influence of CPD and might well be worth considering in future research. This multi-perspective approach to TBs and the use of profiling in Article 1, along with the thematic analysis of teachers' comments and the implementation of the IMTPG in Article 2, consistently suggest that the discrepancy between the TBs held and enacted by teachers already happens in the pre-class phase of teaching, which implies that the loss of transformative power of CPD greatly occurs before classroom practice. As mentioned earlier, this finding aligns with CPD approaches emphasising the importance of lesson planning in educational change, but research exploring how far the pre-class phase of teaching is a relevant obstacle hampering belief change is needed. In this sense, studies eliciting the TBs enacted by teachers in both their lesson plans and their classroom practice would provide a more comprehensive understanding of the effectiveness of CPD.

The possible prevalence of teachers' perception of students' satisfaction over that of their learning as a factor influencing change in TBs that has been detected in Article 3 but overlooked within the field of teachers' beliefs might well deserve further attention. While the previous subsection 7.2.2 dealing with the empirical contributions has shown that there is evidence that teachers tend to conflate student engagement with student learning, the findings of this study suggest that this is not necessarily the case, since all the participants distinguishing both aspects in their reflections also implied the priority of the former over the latter.

The profiles found in this study might well be context-dependant, and replications where the researcher's position could minimise the existence of possible vested interests in the findings would be welcome. Moreover, this study covers the evolution of TBs in response to a two-year CPD programme during the programme itself, and the changes uncovered in the 3 growth networks detected in Article 3 by implementing the IMTPG, while pointing to sustained belief development, might well end up being just situational variations. In this sense, studies addressing the evolution of TBs once CPD programmes have finished are needed. Furthermore,

studies addressing longer programmes would allow to explore how far teachers can move from the reportedly to the effectively adaptive profile, and thus to evaluate how far the discrepancy between reported and enacted TBs is a sign of belief change.

Finally, mixing methods has been highlighted as a 'strength' in research into teachers' beliefs (e.g., Levin, 2015) and seems particularly necessary if TBs are multifaceted and require the adoption of as many perspectives as possible for their elicitation. In this sense, my philosophical engagement to ensure consistency between ontology, epistemology, and methodology seems particularly pertinent. Article 1 pioneers the study of the epistemological and methodological implications of Zubiri's notion of reality for social research. It is true that the international diffusion of Zubiri's philosophy in the anglosphere is still in its infancy (Xavier Zubiri Foundation of North America), but his work delving into the nature of human intellection and including his analysis of 'primordial apprehension' has been translated into English (Zubiri, 1999) among other languages. The power of this middle-ground ontology to question the supposed insurmountable nature of the issue of paradigm incommensurability deserves further exploration, and its potentiality to underpin the use of mixed methods as a promising alternative to other approaches such as pragmatism and critical realism might well be worth considering in future research.

7.3.2 Recommendations for teacher educators

This thesis originated in a problem of practice: the necessity for teacher educators to understand how CPD influences teachers' beliefs when it comes to designing effective programmes. The understand gained through the findings allows to make some recommendations for teacher educators within contexts of educational reform towards constructivism in post-obligatory, secondary schooling. I would recommend focusing on helping teachers to develop their beliefs about teaching, as otherwise the change driven, if any, would be superficial and situational, lasting just for the duration of the CPD programme. Moreover, I suggest designing bespoke in-service teacher education programmes that meet the requirements of effective CPD highlighted by the literature, which were highly appreciated by participants in this study, such as providing

sustained and personalised support. I would particularly remark the importance of providing teachers with operational methodologies that are directly transferable to their classroom practice. When doing so, it is highly advisable to make the programme designed experiential by having participants live the type of learning experience provoked by this methodology as if they were students, since this will help them to better understand the intended change, and thus commit to the programme.

Given the differences between vocational education and baccalaureate teachers in prior TBs and thus in type of response to CPD, I would propose considering the suitability of following different recruitment strategies when designing the bespoke CPD programme, grouping teachers according to type of schooling. Vocational education teachers appear to be more effectively adaptive to the intended change, with more constructivist, competence-led prior TBs, possibly because their teaching practice is aimed at helping students to enter in the labour market. Baccalaureate teachers, in contrast, appear to have more traditional, content-centred prior TBs, which hampers the enaction of the new constructivist TBs when lesson planning, possibly because their practice aims to help students to keep learning at university rather than to start their working life.

To infer how far teachers develop their TBs, I suggest considering not only what they directly report or indirectly imply in their comments, but also what they actually do. In this sense, teacher educators should bear in mind that teachers' teaching action already begins before classroom practice in the lesson planning phase, when a great part of the loss of the transformative power of CPD appears to occur. Accordingly, it is important for them to realise that the discrepancy between reported and enacted TBs highlighted by the literature can greatly derive from the difficulty experienced by teachers when planning lessons for a new teaching practice, which seems to act as a relevant obstacle for the intended educational change. This is why I would highly recommend devoting part of the sustained, personalised support to assisting teachers in the design of lesson plans, considering the suitability of following professional

development approaches which emphasise the importance of this phase of teaching practice, such as those mentioned in Article 3 and in the previous subsection 7.2.2.

I would also recommend teacher educators paying particular attention to how teachers feel, considering not only the cognitive content but also the emotional load of their reflections on, and re-evaluations of, their experience with the new classroom practice and its subsequent outcomes. When doing so, I suggest taking years of teaching experience into consideration in 2 ways. Firstly, as the findings suggest that the less teaching experience, the more maladaptive change in novice teachers when designing lesson plans for, and managing the challenges of, the new classroom practice, I would recommend providing them with particularly careful support; they appear to experience the changes entailed in the domain of practice more negatively, which leads them to be more resistant to the intended change. Secondly, and conversely, as these teachers were much more positively influenced by the implications of the new practice in the domain of outcomes in terms of learning, it would be advisable to take special care in helping experienced teachers to appreciate the possible effects of the new teaching practice on student learning.

The last recommendation seems particularly relevant, given the possible prevalence of teachers' perception of students' satisfaction with the new teaching practice over that of their learning as a factor influencing change in their TBs. In this sense, I would propose teacher educators putting particular emphasis on helping teachers, and particularly those with more teaching experience, to avoid the tendency to conflate student engagement with student learning. Teachers should be clear that, while student enjoyment and positive classroom experience may be desirable educational outcomes, the key question is the extent to which the intended change in teaching practice entails student learning gains.

8. List of references not included in the articles

Abdelkhalek, N., Hussein, A., Gibbs, T., & Hamdy, H. (2010). Using team-based learning to prepare medical students for future problem-based learning. *Medical teacher*, *32*(2), 123-129. https://doi.org/10.3109/01421590903548539

Achinstein, B., & Ogawa, R. (2011). Change (d) agents: School contexts and the cultural/professional roles of new teachers of Mexican descent. *Teachers College Record*, *113*(11), 2503–2551. https://doi.org/10.1177/016146811111301103

Anwar, K., Shaikh, A. A., Dash, N. R., & Khurshid, S. (2012). Comparing the efficacy of team-based learning strategies in a problem-based learning curriculum. *Apmis*, *120*(9), 718-723. https://doi.org/10.1111/j.1600-0463.2012.02897.x

Avalos-Bevan, B., & Bascopé, M. (2017). Teacher Informal Collaboration for Professional Improvement: Beliefs, Contexts, and Experience. *Education Research International*, *2017*(1). https://doi.org/10.1155/2017/1357180

Bhaskar, R. 1975. A Realist Theory of Science, Leeds, UK: Leeds Books.

Bhaskar, R. 1978. The Possibility of Naturalism, Sussex, UK: Harvester Press.

Bhaskar, R. 1989. Reclaiming reality, London, UK: Verso.

Beach, D., & Kaas, J. G. (2020). The Great Divides: Incommensurability, the Impossibility of Mixed-Methodology, and What to Do about It. *International Studies Review*, *22*(2), 214–235. https://doi.org/10.1093/isr/viaa016

Berger, R. (2015). Now I see it, now I don't: researcher's position and reflexivity in qualitative research. *Qualitative Research*, *15*(2), 219–234. https://doi.org/10.1177/1468794112468475

Bird, F. (2020). A defense of objectivity in the social sciences, rightly understood. *Sustainability: Science, Practice, and Policy*, *16*(1), 83–98. https://doi.org/10.1080/15487733.2020.1785679

Borko, H., Liston, D., & Whitcomb, J. A. (2007). Genres of Empirical Research in Teacher Education [Article]. *Journal of Teacher Education*, *58*(1), 3–11. https://doi.org/10.1177/0022487106296220

Borremans, L. F. N., & Spilt, J. L. (2022). Development of the Competence Measure of Individual Teacher-Student Relationships (COMMIT): Insight Into the Attitudes, Knowledge, and Self-Efficacy of Pre-service Teachers. *Frontiers in Education*, *7*. https://doi.org/10.3389/feduc.2022.831468

British Educational Research Association [BERA] (2018) Ethical Guidelines for Educational Research, fourth edition, London. Retrieved from https://www.bera.ac.uk/researchers-resources/publications/ethical guidelines-for-educational-research

British Educational Research Association (BERA). (2018). Close-To-Practice Educational Research: A BERA Statement. Retrieved from https://www.bera.ac.uk/publication/bera-statement-on-close-to-practice-research [Accessed 14 April 2020]

Bullough, R. V, & Pinnegar, S. *Guidelines for Quality in Autobiographical Forms of Self-Study Research*. *Educational researcher*, *30*(3), 13-21. https://doi.org/10.3102/0013189X030003013

Burgess, A., Bleasel, J., Haq, I., Roberts, C., Garsia, R., Robertson, T., & Mellis, C. (2017). Team-based learning (TBL) in the medical curriculum: better than PBL? *BMC medical education*, *17*(1), 243. https://doi.org/10.1186/s12909-017-1068-z.

Callahan, J. L. (2004). Breaking the cult of rationality: Mindful awareness of emotion in the critical theory classroom. *New Directions for Adult and Continuing Education*, *2004*(102), 75–83. https://doi.org/10.1002/ace.140

Callahan, J. L., & McCollum, E. E. (2002). Conceptualizations of Emotion Research in Organizational Contexts. *Advances in Developing Human Resources*, *4*(1), 4–21. https://doi.org/10.1177/1523422302004001002

Chirema, K. D. (2007). The use of reflective journals in the promotion of reflection and learning in post-registration nursing students. *Nurse Education Today*, *27*(3), 192–202. https://doi.org/10.1016/j.nedt.2006.04.007

Cochran-Smith, M., & Donnell, K. (2012). Practitioner Inquiry: Blurring the Boundaries of Research and Practice. In J. Green, G. Camilli, & P. Elmore (Eds.), *Handbook of Complementary Methods in Education Research*. 3rd ed. Lawrence Erlbaum Associates, 503–518 http://ebookcentral.proquest.com/lib/oxford/detail.action?docID=446575.

Cohen, L., Morrison, K., & Manion, L. (2018). *Research Methods in Education* (8th ed.). Routledge.

Cope, J., & Watts, G. (2000). Learning by doing - An exploration of experience, critical incidents and reflection in entrepreneurial learning. *International Journal of Entrepreneurial Behaviour & Research*, *6*(3), 104–124. https://doi.org/10.1108/13552550010346208

Copur-Gencturk, Y., & Thacker, I. (2021). A Comparison of Perceived and Observed Learning From Professional Development: Relationships Among Self-Reports, Direct Assessments, and Teacher Characteristics. *Journal of Teacher Education*, *72*(2), 138–151. https://doi.org/10.1177/0022487119899101

Cranton, P. (2006). Fostering authentic relationships in the transformative classroom. *New Directions for Adult and Continuing Education*, *2006*(109), 5–13. https://doi.org/10.1002/ace.203

Cranton, P., & Roy, M. (2003). When the Bottom Falls Out of the Bucket: Toward A Holistic Perspective on Transformative Learning. *Journal of Transformative Education*, *1*(2), 86–98. https://doi.org/10.1177/1541344603001002002

Creswell, J., & Tashakkori, A. (2007). Differing Perspectives on Mixed Methods Research Journal of Mixed Methods. *Journal of Mixed Methods Research*, *1*(4), 303–308. https://doi.org/10.1177/1558689807306132

Creswell, J. W. (2013). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (4th ed.). Sage Publications.

Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and conducting mixed methods research* (3rd ed.). Los Angeles: SAGE Publications.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Los Angeles: SAGE Publications.

da Ponte, J. P., Quaresma, M., & Mata-Pereira, J. (2022). Teachers' learning in lesson study: insights provided by a modified version of the interconnected model of teacher professional growth. *ZDM - Mathematics Education*, *54*(2), 373–386. https://doi.org/10.1007/s11858-022-01367-1

Dana, N. F., & Yendol-Hoppey, D. (2020). The reflective educator's guide to classroom research: learning to teach and teaching to learn through practitioner inquiry. 4th ed. Thousand Oaks: Corwin.

Deal, D., & White, C. S. (2006). Voices from the classroom: Literacy beliefs and practices of two novice elementary teachers. *Journal of Research in Childhood Education*, *20*(4), 313–329. https://doi.org/10.1080/02568540609594570

Desimone, L. M., & Pak, K. (2017). Instructional Coaching as High-Quality Professional Development. In *Theory into Practice* (Vol. 56, Number 1, pp. 3–12). Taylor & Francis. https://doi.org/10.1080/00405841.2016.1241947

Dirkx, J. M., Mezirow, J., & Cranton, P. (2006). Musings and Reflections on the Meaning, Context, and Process of Transformative Learning: A Dialogue Between John M. Dirkx and Jack Mezirow. *Journal of Transformative Education*, *4*(2), 123–139. https://doi.org/10.1177/1541344606287503

Dolmans, D., Michaelsen, L., Van Merrienboer, J., & van der Vleuten, C. (2015). Should we choose between problem-based learning and team-based learning? No, combine the best of both worlds! *Medical teacher*, *37*(4), 354-359. https://doi.org/10.3109/0142159X.2014.948828.

Durak, B., & Topçu, M. S. (2025). Exploring Teachers' Professional Development on Socioscientific Issues and Model-Based Learning: A Multiple Case Study. *Science and Education*. https://doi.org/10.1007/s11191-025-00628-1

Eisenhart, M., & Howe, K. (1992). Validity in Qualitative Research. In M. LeCompte, W. Milroy, & J. Preissie (Eds.), *The Handbook of Qualitative Research in Education*. Academic Press, 643–680.

Ekehammar, B., & Akrami, N. (2003). The Relation between Personality and Prejudice: A Variable- and a Person-Centred Approach. *European Journal of Personality*, *17*(6), 449–464. https://doi.org/10.1002/per.494

Evans, L. (2014). Leadership for professional development and learning: Enhancing our understanding of how teachers develop. *Cambridge Journal of Education*, *44*(2), 179–198. https://doi.org/10.1080/0305764X.2013.860083

Farrugia, M. A. (2021). *Teacher Agency in Professional Learning and Development: Teachers leading their own professional growth*. (PhD thesis). UCL Institute of Education, University College London.https://doi.org/https://discovery.ucl.ac.uk/id/eprint/10134026/

Finch, M. (2021). Making Sense of Methods: What Does Systematic and Intentional Practitioner Research Look Like? *Journal of Practitioner Research*, *6*(2). https://doi.org/10.5038/2379-9951.6.2.1195

Finch, M. (2022). Complexities of Practitioner Research: Seeking Hallmarks of Quality. *Impacting Education: Journal on Transforming Professional Practice*, *7*(3), 1–10. https://doi.org/10.5195/ie.2022.256

Fives, H., Lacatena, N., & Gerard, L. (2015). Teachers' beliefs about teaching (and learning). In H. Fives & M. Gill (Eds.), International handbook of research on teachers' beliefs (pp. 249–265). Routledge

Fletcher, S. S., & Luft, J. A. (2011). Early career secondary science teachers: A longitudinal study of beliefs in relation to field experiences. *Science Education*, *95*(6), 1124–1146. https://doi.org/10.1002/sce.20450

Foreman-Peck, L., & Winch, C. (2010). *Using educational research to inform practice: A practical guide to practitioner research in universities and colleges*. Routledge.

Forrest, S. (2018). Can CPD enhance student-centred teaching and encourage explicit instruction of International Baccalaureate Approaches to Learning skills? A qualitative formative assessment and summative evaluation of an IB school's in-house CPD programme. *Journal of Research in International Education*, *17*(3), 262–285. https://doi.org/10.1177/1475240918816401

Foster, C. (2024). Methodological pragmatism in educational research: from qualitative-quantitative to exploratory-confirmatory distinctions. *International Journal of Research and Method in Education*, *47*(1), 4–19. https://doi.org/10.1080/1743727X.2023.2210063

Gore, P. A. (2000). Cluster analysis. In H. E. A. In H. Tinsley & S. D. Brown (Eds.), *Handbook of applied multivariate statistics and mathematical modeling* (pp. 297–321). Academic Press.

Gorski, P. S. (2013). "What is Critical Realism? And Why Should You Care?" *Contemporary Sociology: A Journal of Reviews*, *42*(5), 658–670. https://doi.org/10.1177/0094306113499533

Hammersley, M. (2008). Troubling criteria: A critical commentary on Furlong and Oancea's framework for assessing educational research. *British Educational Research Journal*, *34*(6), 747–762. https://doi.org/10.1080/01411920802031468

Hammersley, M. (2013). *What is qualitative research?* London: Bloomsbury Academic.

Hampson, T., & McKinley, J. (2023). Problems posing as solutions: Criticising pragmatism as a paradigm for mixed research. *Research in Education* 116(1), 124–138. https://doi.org/10.1177/00345237231160085

Harris, A., & DeFlaminis, J. (2016). Distributed leadership in practice. *Management in Education*, *30*(4), 141–146. https://doi.org/10.1177/0892020616656734

Hartnett, J.E., 2011. *Professional growth through working together: a study of reciprocal benefits for teacher and education advisor through classroom based professional development*. Professional Doctorate thesis. Queensland University of Technology. https://eprints.qut.edu.au/48045/1/Judith_Hartnett_Thesis.pdf

Heikkinen, H. L. T., de Jong, F. P. C. M., & Vanderlinde, R. (2016). What is (good) practitioner research? *Vocations and Learning*, *9*(1), 1–19. https://doi.org/10.1007/s12186-016-9153-8

Heikkinen, H. L. T., Huttunen, R., & Syrjälä, L. (2007). Action research as narrative: Five principles for validation. *Educational Action Research*, *15*(1), 5–19. https://doi.org/10.1080/09650790601150709

Heikkinen, H. L. T., Huttunen, R., Syrjälä, L., & Pesonen, J. (2012). Action research and narrative inquiry: Five principles for validation revisited. *Educational Action Research*, *20*(1), 5–21. https://doi.org/10.1080/09650792.2012.647635

Herr, K., & Anderson, G. L. (2015). *The action research dissertation: A guide for students and faculty*. SAGE Publications. https://doi.org/10.4135/9781452226644

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher*, *33*(7), 14–26. https://doi.org/10.3102/0013189X033007014

Justi, R., & van Driel, J. (2006). The use of the Interconnected Model of Teacher Professional Growth for understanding the development of science teachers' knowledge on models and modelling. *Teaching and Teacher Education*, *22*(4), 437–450. https://doi.org/10.1016/j.tate.2005.11.011

Kacen, L., & Chaitin, J. (2006). The Times They are a Changing": Undertaking Qualitative Research in Ambiguous, Conflictual, and Changing Contexts. *The Qualitative Report*, *11*(2), 209–228.

Kager, K., Mynott, J. P., & Vock, M. (2023). A conceptual model for teachers' continuous professional development through lesson study: Capturing inputs, processes, and outcomes. *International Journal of Educational Research Open*, *5*. https://doi.org/10.1016/j.ijedro.2023.100272

Kaushik, V., & Walsh, C. A. (2019). Pragmatism as a research paradigm and its implications for Social Work research. *Social Sciences*, *8*(9), 255 https://doi.org/10.3390/socsci8090255

Kerlinger, N., & Kaya, E. (1959a). The construction and factor analytic validation of scales to measure attitudes toward education. *Educational and Psychological Measurement*, *19*(1), 13–29. https://doi.org/10.1177/001316445901900102

Kerlinger, N., & Kaya, E. (1959b). The predictive validity of scales constructed to measure attitudes toward education. *Educational and Psychological Measurement*, *19*(3), 305–317. https://doi.org/10.1177/001316445901900303

Lebak, K. (2015). Unpacking the Complex Relationship Between Beliefs, Practice, and Change Related to Inquiry-Based Instruction of One Science Teacher. *Journal of Science Teacher Education*, *26*(8), 695–713. https://doi.org/10.1007/s10972-015-9445-0

Levin, M. (2012). Academic integrity in action research. *Action Research*, *10*(2), 133–149. https://doi.org/10.1177/1476750312445034

Li, S., Chen, G., Xing, W., Zheng, J., & Xie, C. (2020). Longitudinal clustering of students' self-regulated learning behaviors in engineering design. *Computers and Education*, *153*, 103899. https://doi.org/10.1016/j.compedu.2020.103899

Lomas, L. (2018). Proposed structural refinements to the interconnected model of teacher professional growth. In J. Hunter, P. Perger, & L. Darragh (Eds.), *Proceedings of the 41st Annual Conference of the Mathematics Education Research Group of Australasia* (pp. 495–502). Auckland: MERGA. https://files.eric.ed.gov/fulltext/ED592471.pdf

Lundgren, H., & Poell, R. F. (2016). On Critical Reflection: A Review of Mezirow's Theory and Its Operationalization. In *Human Resource Development Review 15*(1), pp. 3–28. Thousand Oaks: Sage. https://doi.org/10.1177/1534484315622735

Maarouf, H. (2019). Pragmatism as a Supportive Paradigm for the Mixed Research Approach: Conceptualizing the Ontological, Epistemological, and Axiological Stances of

Pragmatism. *International Business Research*, *12*(9), 1-12. https://doi.org/10.5539/ibr.v12n9p1

Malkki, K. (2010). Building on Mezirow's Theory of Transformative Learning: Theorizing the Challenges to Reflection. *Journal of Transformative Education*, *8*(1), 42–62. https://doi.org/10.1177/1541344611403315

Mallick, K., & Verma, G. (1998). *Researching education: Perspectives and techniques*. Routledge.

Maxwell, J. A., & Mittapalli, K. (2010). Realism as a stance for mixed methods research. In A. Tashakk ori & C. Teddlie (Eds.), *Handbook of mixed methods in social & behavioral research* (*2nd Ed.). SAGE,* 145-168.

Montuschi, E. (2004). Rethinking objectivity in social science. In *Social Epistemology* (Vol. 18, Issues 2–3, pp. 109–122). https://doi.org/10.1080/0269172042000249246

Mukumbang, F. C. (2023). Retroductive theorizing: a contribution of critical realism to mixed methods research. *Journal of Mixed Methods Research*, *17*(1), 93-114. https://doi.org/10.1177/15586898211049847

Nisbet, J., & Watt, J. (1984). Case study. In J. Bell, T. Bush, A. Fox, J. Goodey, & S. Goulding (Eds.), *Conducting Small-Scale Investigations in Educational Management* (pp. 72–92). Harper & Row.

Niyozov, S. (2008). Understanding teaching beyond content and method: Insights from central Asia. *European Education*, *40*(4), 46–69. https://doi.org/10.2753/EUE1056-4934400403

Okubo, Y., Ishiguro, N., Suganuma, T., Nishikawa, T., Takubo, T., Kojimahara, N., ... & Yoshioka, T. (2012). Team-based learning, a learning strategy for clinical reasoning, in students with problem-based learning tutorial experiences. *The Tohoku journal of experimental medicine*, *227*(1), 23-29. https://doi.org/10.1620/tjem.227.23

Ono, S. I., Ito, Y., Ishige, K., Inokuchi, N., Kosuge, Y., Asami, S., ... & Kishikawa, Y. (2017). Verification of Learning Effects by Team-based Learning. *Yakugaku zasshi: Journal of the Pharmaceutical Society of Japan*, *137*(11), 1419-1423. https://doi.org/10.1248/yakushi.17-00094

Oolbekkink-Marchand, H. W., van der Steen, J., & Nijveldt, M. (2014). A study of the quality of practitioner research in secondary education: impact on teacher and school development. *Educational Action Research*, *22*(1), 122–139. https://doi.org/10.1080/09650792.2013.854175

Ormston, R., Spencer, L., Barnard, M., & Snape, D. (2014). The foundations of qualitative research. In J. Ritchie, J. Lewis, C. M. Nicholls, & Rachel Ormston (Eds.), *Qualitative research in practice* (2nd ed.). Los Angeles: SAGE Publishing, 1–26.

Padgett, D. K. (2008). *Qualitative methods in social work research*. Thousand Oakes: SAGE publications.

Plutchik, R. (1980). Emotions: A general psycho-evolutionary theory. In R. Plutchik & H. Kellerman (Eds.), *Theories of emotion* (pp. 3-33). Academic Press. https://dx.doi.org/10.1016/B978-0-12-558701-3.50007-7

Purdie, N., & Hattie, J. (2002). Assessing students' conceptions of learning. *Australian Journal of Educational and Developmental Psychology*, *2*, 17–32.

Pring, R. (2015). *Philosophy of Educational Research* (3rd Ed.). Bloomsbury Academic.

Richards, L. (2021). *Handling qualitative data: A practical guide* (4th ed.). SAGE.

Ruspini, E. (2002). *Introduction to longitudinal research*. London, Routledge

Scott, S. M. (1997). The Grieving Soul in the Transformation Process. *New Directions for Adult and Continuing Education*, *1997*(74), 41–50. https://doi.org/10.1002/ace.7405

Şentürk, C., & Baş, G. (2021). Investigating the relationship between teachers' teaching beliefs and their affinity for lifelong learning: The mediating role of change tendencies. *International Review of Education*, *67*(5), 659–686. https://doi.org/10.1007/s11159-021-09917-7

Simons, H. (2009). *Case study research in practice*. SAGE.

Singh, N., Gupta, R., & Mahalakshmi, V. N. (2018). Multistation exercises: a combination of problem-based learning and team-based learning instructional design for large-enrollment classes. *Advances in physiology education*, *42*(3), 424-428. https://doi.org/10.1152/advan.00023.2018

Small, M. L. (2011). How to conduct a mixed methods study: Recent trends in a rapidly growing literature. *Annual Review of Sociology*, *37*, 57–86. https://doi.org/10.1146/annurev.soc.012809.102657

Spencer, L., Ritchie, J., Ormston, R., O'Connor, W., & Barnard, M. (2014). Analysis: Principles and processes. In J. Ritchie, J. Lewis, C. McNaughton Nicholls, & R. Ormston (Eds.), *Qualitative research practice* (2nd ed., pp. 269–293). SAGE.

Stamenkovic, P. (2023). Facts and objectivity in science. *Interdisciplinary Science Reviews*, *48*(2), 277–298. https://doi.org/10.1080/03080188.2022.2150807

Stenhouse, L. (2013). What counts as research? In T. Booth, M. Masterton, P. Potts, & W. Swann (Eds.) *Curricula for Diversity in Education*. Routledge, 293-303.

Strom, K. J., Mills, T., & Abrams, L. (2023). *Non-linear perspectives on teacher development: complexity in professional learning and practice* (K. J. Strom, T. Mills, & L. Abrams, Eds.; 1st ed.) [Book]. Routledge. https://doi.org/10.4324/9781003372097

Tashakkori, A., Johnson, R. B., & Teddlie, C. (2020). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. SAGE publications.

Tisdell, E. J., & Tolliver, D. E. (2001). The Role of Spirituality in Culturally Relevant and Transformative Adult Education. *Adult learning 12*(3), 13–14. https://doi.org/10.1177/104515950101200305

Urmeneta, O. (2018). *Driving educational change at school federation level: A case study of Team-Based Learning* [Master's thesis]. University of Oxford. https://ora.ox.ac.uk/objects/uuid:47d5daee-c7e8-47cc-aba7-5f10b038127e/files/ddn39x226n

Van Driel, J. H., & Verloop, N. (2002). Experienced teachers' knowledge of teaching and learning of models and modelling in science education. *International Journal of Science Education*, *24*(12), 1255–1272. https://doi.org/10.1080/09500690210126711

Vanassche, E., & Kelchtermans, G. (2015). The state of the art in Self-Study of Teacher Education Practices: A systematic literature review. *Journal of Curriculum Studies*, *47*(4), 508–528. https://doi.org/10.1080/00220272.2014.995712

Verschuren, P. J. M. (2003). Case study as a research strategy: Some ambiguities and opportunities. *International Journal of Social Research Methodology: Theory and Practice*, *6*(2), 121–139. https://doi.org/10.1080/13645570110106154

Vogels, R. (2009). Gelukkig voor de klas? Leraren voortgezet onderwijs over hun werk [Happy to be teaching? Secondary teachers on their work]. Den Haag: Sociaal en Cultureel Planbureau.

Vogeltanz-Holm, N., Olson, L. M., Borg, K. E., & Hill, T. M. (2014). Implementation and Evaluation of a Team-Based Learning Approach Within a Hybrid Problem-Based Learning Medical Education Curriculum. *Medical Science Educator*, *24*(1), 125-133. https://doi.org/10.1007/s40670-014-0008-3.

Wenger, E. (1998). Communities of practice: Learning as a social system. *The Systems Thinker, 9*(5), 2–3. Retrieved from https://scholar.google.es/scholar?hl=en&as_sdt=0%2C5&q=Communities+of+practice%3A+Learning+as+a+social+system&btnG= [Accessed 5 July 2026]

Westbroek, H., Janssen, F., Mathijsen, I., & Doyle, W. (2022). Teachers as researchers and the issue of practicality. *European Journal of Teacher Education*, *45*(1), 60–76. https://doi.org/10.1080/02619768.2020.1803268

Wodak, R. (2014). Critical discourse analysis. In C. Leung & B. Street (Eds.), *The Routledge Handbook of Discourse Analysis* (pp. 302–316). Routledge.

Wongsopawiro, D. S., Zwart, R. C., & van Driel, J. H. (2017). Identifying pathways of teachers' PCK development. *Teachers and Teaching: Theory and Practice*, *23*(2), 191–210. https://doi.org/10.1080/13540602.2016.1204286

Wyatt, M. (2010). An English teacher's developing self-efficacy beliefs in using groupwork. *System*, *38*(4), 603–613. https://doi.org/10.1016/j.system.2010.09.012

Yin, R. K. (2009). *Case Study Research: Design and Methods* (4th ed.). Sage.

Zachariadis, M., Scott, S., & Barrett, M. (2013). Methodological implications of critical realism for mixed-methods research. *MIS quarterly*, 855-879. https://www.jstor.org/stable/43826004

Zeichner, K., & Noffke, S. (2001). Practitioner Research. In V. Richardson (Ed.), *Handbook of Research on Teaching.* Washington DC: American Educational Research Association, 298–329.

Zwart, R. C., Wubbels, T., Bergen, T. C. M., & Bolhuis, S. (2007). Experienced teacher learning within the context of reciprocal peer coaching. In *Teachers and Teaching: Theory and Practice* (Vol. 13, Issue 2, pp. 165–187). https://doi.org/10.1080/13540600601152520

9. Appendices

Appendix 1: supervisors' co-authorship statement

University of Oxford
Department of Education
15 Norham Gardens, Oxford OX2 6PY
Email: nigel.fancourt@education.ox.ac.uk

24th August 2026

Oscar Urmeneta: Co-authorship Statement

Dear Professor Brooks and Dr Burn,

Further to Oscar's recent viva and report, for the co-authored papers, we can confirm, in line with the requirements in *Policy and Guidance on Research* (2026), Annex B on Integrated Theses, that "the greater part of the work is directly attributed to the candidate" (p. 70). Further, we fully agree with Oscar's summary of our contributions in the amended thesis.

Yours sincerely,



Dr Nigel Fancourt – Director of Doctoral Research



Professor Ariel Lindorff

Appendix 2: making the research journal available for public scrutiny

As the University of Oxford prevents me to copy the link to my research journal hosted in the university's One Drive and share it to anyone, the most reliable way to allow unrestricted public access without using Microsoft accounts is to publish the content as a web page and to include the URL to this site in Article 1.

However, this option might not enable readers to have the genuine navigation experience as in its original format. As a result, I stored a copy of the notebook including the research journal in my personal One Drive application, then I created a link accessible to anyone with permission to view but not to edit, and finally I included this link within the body of the text of Article 1 (page 77 of this thesis), so that the journal is available for public scrutiny.

As clicking on the link leads the reader to the online version of OneNote, readers interested in consulting the journal do not need to be users of Microsoft and thus the availability is universal. This is the link: Mixed Research Journal

Appendix 3: sample of narrative account

[04/10/2022 17:54] Participant 101
REFLEXIÓN TRAS LA FORMACIÓN PRESENCIAL
Antes de acudir a la formación presencial pensaba que esta metodología sería parecida a cosas que hacemos diariamente en nuestras materias y que sería bueno aplicarlo en el aula pero no obtendríamos resultados distintos.
En este momento de la formación, estoy ilusionada por implementar el TBL en el aula, tener resultados y sobre todo ver si la motivación del alumnado cambia.

[04/10/2022 18:36] Participant 101
UNIDAD 1 TBL
Hola, Óscar
Te envío la unidad acabada sobre el teatro Barroco para implementar en las aulas de 1º de Bachillerato.
Un saludo

[09/10/2022 00:39] Óscar Urmeneta Maestu
Hola Participant 101. Muchas gracias por tu unidad TBL. Es extraordinaria. En el feedback te hago comentarios, pero solo te propongo un matiz en la actividad 2. Lo demás está pulido.
¿Cuándo la vas a aplicar? Recuerda que la semana antes a los exámenes de evaluación no es buena. Cuando lo hagas, no olvides compartir aquí tu experiencia. Te lo agradeceré mucho y es posible que te pueda ayudar.
Un abrazo muy fuerte y enhorabuena por la unidad.

[09/10/2022 01:55] Participant 101
Buenas noches, Óscar Muchas gracias por tu feedback. En cuanto la implemente en el aula, te comento la experiencia. Un abrazo y gracias de nuevo por la formación recibida.

[10/10/2022 09:35] Participant 101
UNIDAD 2 TBL
Buenos días, Óscar
Te mando la 2ª unidad de TBL que me la dejé hilvanada la semana pasada en la formación. Sería también para 1º de Bachillerato por temario. Cuando puedas ya me la miras y me dices.
Un abrazo

[10/10/2022 17:33] Óscar Urmeneta Maestu
Buenas tardes Participant 101. Muchísimas gracias por tu segunda unidad TBL. Es fantástico!!!!!
Creo que está fenomenal: los resultados de aprendizaje son excelentes, las actividades son fabulosas, el test está perfecto, y todo ello está alineado entre sí. Como podrás ver en mi feedback, te hago algunas sugerencias menores para un par de actividades. Si crees que merece la pena tener alguna de ellas en cuenta, vuelve a compartir la unidad para que yo guarde la versión más actualizada.
Lo único que me preocupa es el tiempo de estudio individual. Dices que será de 90 minutos, lo cual es perfecto, pero ¿no son muchas páginas del libro para leer? Lo importante es que tú estés segura de que con ese tiempo es suficiente.
¿Cuándo piensas aplicar esta, en la segunda evaluación?
Un saludo y mucho ánimo.

[11/10/2022 08:41] Participant 101
Buenos días, Óscar.

Muchas gracias por tu feedback, he cambiado lo que me habías sugerido porque tenías razón y me han parecido interesantes las consideraciones. Te mando la plantilla ya cambiada para que guardes la versión actualizada.
Con respecto al tiempo de estudio previo, parecen muchas páginas pero en realidad es porque hay actividades y muchos ejemplos de textos, yo en las indicaciones previas les diría en qué se tienen que centrar para preparar la unidad.
Pienso aplicarla justo antes de Navidad o nada más volver, dependiendo cómo vaya con lo demás. Como es una unidad aislada del temario que no tiene continuidad (no es como la literatura, la gramática o la sintaxis que abarcan más temas...) me da juego para trabajarla en esas semanas.
Tengo ya medio hilvanada la de la 3ª evaluación sobre la literatura del Neoclasicismo, en breve te la mando porque he tenido algunas dudas con las actividades de aplicación.
Un saludo y muchas gracias

[11/10/2022 11:31] Óscar Urmeneta Maestu
Muy bien Participant 101. Qué fantástico trabajo. Ya estás pensando en la tercera unidad!
Me quedo tranquilo respecto a los materiales, pues lo tienes controlado y bien valorado.
Las fechas justo antes o después de Navidad son estupendas.
Cuídate,
Oscar.

[11/10/2022 13:02] Participant 101
UNIDAD 3 TBL
Buenos días, Óscar
te mando la unidad 3 sobre la literatura del Neoclasicismo. En esta he tenido dificultades con las actividades de aplicación porque aunque se ajustan a lo que yo pretendía (que trabajaran con textos neoclásicos porque es un periodo literario del que no solemos mandar lecturas) creo que se parecen todas demasiado.
Ya me comentas lo que creas oportuno.
Un abrazo

[12/10/2022 10:46] Óscar Urmeneta Maestu
Hola Participant 101. Gracias por tu unidad 3!!!!!!!! Es fabuloso!!!!
thewave3thewave4thewave4
Creo que todavía está sin terminar. Te envío mi feedback con una sugerencia para los resultados de aprendizaje y dos sugerencias para las dos primeras actividades de aplicación. Sabes qué quieres conseguir, pero no terminan de tener el formato satisfactorio que permita trabajarlas de manera que el alumnado aprenda reflexionando y discutiendo en y entre equipos. Comprueba si esas dos sugerencias te sirven, y trata de aprovechar ese tipo de planteamiento para las otras actividades. Creo que tienen muchísimo potencial, pero tienes que elaborarlas un poco más. No he corregido el test, porque tiene que estar perfectamente alineado con las actividades y todavía no están terminadas. El test vendría después. A ver si te he ayudado algo.
Un abrazo y feliz Día del Pilar.
Oscar.

[12/10/2022 10:51] Participant 101
Perfecto, la rehago y te la envío de nuevo cuando la tenga. Tengo tiempo porque esta sería para aplicarla en la 3 evaluación. Un saludo y feliz día!!

[14/10/2022 10:41] Participant 101
Buenos días, Óscar Urmeneta Maestu
He rehecho la unidad, sobretodo las actividades de aplicación con las ideas que me diste para las dos primeras. Tenías toda la razón que no eran actividades TBL como tal. Yo ya me di cuenta de

que algo fallaba, pero como quería que trabajaran textos y a la vez que los conectaran con la actualidad, no sabía cómo hacerlo y eso que justo son textos que dan mucho pie a la reflexión. Además esta unidad quería que abarcara solo 3 sesiones porque es para final de curso y siempre llego muy justa de temario y ahora creo que las actividades son más concretas y me va mejor por el tiempo. Ahora creo que he conseguido lo que quería pero falta que me digas si he redactado bien las actividades.
Te la reenvío de nuevo (en morado hay algunas cosas cambiadas con las indicaciones que me diste). Muchas gracias

[15/10/2022 16:49] Óscar Urmeneta Maestu
Buenas tardes Participant 101. Ahora sí! Ahora las actividades sí que me gustan y son TBL. Creo que están fenomenal.
En mi feedback te planteo dos cosas:

- La primera es que no entiendo la parte 2 de la actividad 5. ¿Es posible que mezcles dos ideas que hayas tenido pero que solo valga una?
- La segunda es una posible mejora para el test. Tiene muchos items negativos, que resultan más difíciles para el alumnado. Para asegurar más que a quien ha estudiado le salga bien, te sugiero poner en todas las preguntas 4 opciones en lugar de 5. ¿Cómo lo ves?

Por lo demás, la unidad ya está redonda.
Un abrazo enorme,

[17/10/2022 08:53] Participant 101
Buenos días, Óscar Urmeneta Maestu
Efectivamente había un fallo en la actividad 5, es que inicialmente quería plantearla de otra forma y dejé sin querer las dos opciones. He simplificado un poco el test como me has sugerido dejando en las negativas 4 opciones en lugar de 5.
Te la vuelvo a mandar ya rectificada.
Muchas gracias

[30/11/2022 21:33] Participant 101
O si eso desvirtúa un poco la idea del TBL. Gracias Óscar Urmeneta Maestu

[03/12/2022 10:56] Óscar Urmeneta Maestu
Buenos días
Muchísimas gracias por consultarme antes, y espero llegar a tiempo.
Efectivamente, tener ese guión desvirtuaría la eficacia del método. La idea es que el test individual sea lo suficientemente fácil para todo el que ha estudiado como para sacar un buen resultado, que le resulte gratificante y le motive porque le muestra que venir preparado a clase compensa. Si crees que tendrían que necesitar ese material, entonces es que habría que adaptar el test.
No obstante, esta primera experiencia nos mostrará cómo mejorar. Por eso es crítico que me deis vuestro feedback sobre vuestra experiencia.
Un abrazo grandísimo y muchísimas gracias por tu compromiso!!!!!!!

[03/12/2022 10:57] Participant 101
Perfecto, Óscar Urmeneta Maestu Pues ya lo tengo claro... En cuanto lo implemente en el aula, te cuento. Un saludo

[12/12/2022 08:44] Participant 101
DUDA
Buenos días Óscar Urmeneta Maestu

Se me plantea una duda: ¿qué pasa si un alumno/a falta un día y por lo tanto a una parte del TBL? ¿Hace el resto? ¿De la parte que no viene tiene un 0 y se media con las demás actividades? ¿Se queda sin nota del TBL?
Un saludo

[12/12/2022 09:21] Óscar Urmeneta Maestu
Buenos días Participant 101. Efectivamente, a veces pasa.
Si falta el primer día, posiblemente no haya podido hacer ninguno de los tests, por lo que yo le contaría solo las actividades de aplicación y las notas de los tests se las pasaría al examen. Por ejemplo, si el iTest vale 0,4, el tTest 0,2 y las AAs 0,4, yo le pasaría el 0,6 al examen y le contaría solo el 0,4 de las AAs. Si, por el contrario, viene el primer día pero luego falta a la AAs, yo le contaría el 0,6 de los tests, pero el 0,4 de las AAs se lo pasaría al examen.
Para mí esto no es un problema porque yo aplico TBL sistemáticamente y, como me hacen 6-7 tests y 35-40 AAs por evaluación, tengo tests y AAS suficientes para evaluarles. Pero en vuestro caso, siempre sugiero no contar la puntuación de la parte que se pierden. Y si falta toda la semana y no puede hacer nada del TBL o solo viene el último día y apenas resuelve una actividad, el valor del TBL se lo pasaría al examen ya que no ha podido participar.
No dudes en volverme a abordar si no he sido del todo claro.
Un abrazo y mucho ánimo!!!!

[12/12/2022 09:24] Participant 101
Vale, perfecto, lo tengo claro. Me espero a ver si viene el resto de días. Muchas gracias, Óscar Urmeneta Maestu

[14/12/2022 13:19] Participant 101
FEEDBACK
Hola Óscar Urmeneta Maestu
Ya he implementado la primera unidad TBL en el aula. Al final ha sido la de la diversidad lingüística, no la primera que preparé del teatro barroco. Por cuestiones organizativas me ha parecido mejor empezar por esa.
Mi **valoración** general ha sido positiva y a ellos también les ha gustado mucho la forma de trabajar. Creo que he acertado en el momento de realizarla (después de exámenes y antes de Navidad) y los resultados han sido positivos: se han preparado la materia y las notas han sido buenas y eso que realmente pensé a posteriori que me había pasado con el nivel del test individual, pero ha resultado que no.
Como dificultad principal podría señalar que igual hemos aprovechado este momento muchos docentes y estaban un poco saturados de TBL. Y otras dificultades que me han aparecido han sido: cómo evaluar a un alumno/a que ha faltado a parte de las sesiones y que lo he tenido que aplicar a los 3 grupos de 1º de Bachillerato y no sé si tendría que haber buscado diferentes preguntas de test o diferentes actividades de aplicación.
Al volver de Navidad implementaré la de literatura.
Un saludo y muchas gracias.

[14/12/2022 13:45] Óscar Urmeneta Maestu
Hola Participant 101. Muchísimas gracias por el feedback. Me alegro muchísimo de que la experiencia haya sido positiva para el alumnado.
Enhorabuena por haber acertado con el nivel del test, pues a veces tendemos a ponerlo demasiado difícil. Respecto a poner preguntas distintas, eso implicaría más trabajo. Yo solo lo contemplaría si se corre el riesgo del que un grupo pueda pasar información a otro, como por ejemplo si hay un día de por medio entre dos grupos. Yo por eso hago un esfuerzo por asegurar que de un día para otro avanzo lo mismo en todos los equipos, para que no se puedan comunicar, por ejemplo, la solución a una actividad determinada.

Te agradecería infinito si me puedes resumir en 2 líneas (aunque sean solo 2 líneas) por qué para ti ha sido positiva la experiencia. ¿Qué ventaja(s) le has visto a TBL sobre tu práctica habitual? Muchas gracias!

[14/12/2022 13:52] Participant 101
Para mí ha sido una experiencia muy positiva como docente por volver a recuperar la ilusión por enseñar con nuevas metodologías y porque he visto que ellos estaban contentos, que les ha gustado mucho esta forma de trabajar, que los miedos que tenía (a que fuera muy complejo, a que diera o no tiempo, a que les motivaran las actividades de aplicación, a que fuera un momento oportuno, a que la valoración de ellos fuera justa...) no han podido a la ilusión de probar nuevas metodologías.

[21/02 08:18] Óscar Urmeneta Maestu
Buenos días …. Espero que todo vaya bien.
¿Has aplicado ya la segunda unidad TBL? Si así fuera, ¿como te ha ido?
Un abrazo muy fuerte y buena semana.

[21/02 09:11] Participant 101
Hola, Óscar Urmeneta Maestu Estoy esperando a que acaben exámenes para aplicarla, que me parecía mejor época. Haré una al principio de la 3°evaluación y otra al final.Un saludo

[21/02 09:35] Óscar Urmeneta Maestu
Hola Participant 101. Me parece una decisión perfecta. Ya me contarás.
(1 liked)

[21/03 12:41] Participant 101
Buenos días Óscar Urmeneta Maestu
Ya he aplicado la segunda unidad de TBL, la del teatro barroco y muy bien. Creo que el alumnado había preparado mejor el tema porque en el test, pese a tener un poco más de dificultad que el de la primera evaluación, han sacado buenas notas. Además ya tenían más claro cómo se trabajaba y la dinámica. La única dificultad que he encontrado es que no he podido corregir las actividades de aplicación en el momento, porque al tener 3 clases, no quería que se dijeran las respuestas...
Al volver de Pascua implementaré la última unidad, la de la literatura neoclásica.
Un saludo

[21/03 18:27] Óscar Urmeneta Maestu
Buenas tardes Participant 101. Muchísimas, muchísimas, muchísimas gracias por tu feedback!!!!!
Me alegro muchísimo de que te haya salido muy bien. Te lo mereces por lo bien que preparaste la unidad. Que no te quepa ninguna duda: el resultado de los test irá mejorando con el tiempo porque el alumnado se irá familiarizando más con TBL y aprenderá que le conviene llegar preparado a clase. Es una de las ventajas de TBL. Respecto a la corrección de las actividades de aplicación, es lo que puede pasar cuando tienes más de una clase y no las tienes seguidas en el horario. Me parece muy bien lo que hiciste. Con el tiempo iréis ganando seguridad y adoptando las decisiones que sean necesarias sobre la marcha. Me parece muy bien.
Respeto a tu feedback tras la tercera unidad, te pido por favor que me digas brevemente lo que, después de este primer curso, piensas sobre dos aspectos :

- ¿Qué ventajas/incovenientes le ves a TBL para el aprendizaje del alumnado (cuánto aprenden, cómo aprenden...)?
- ¿Qué dificultades encontrarías si quisieras adoptar TBL como metodología preferente, si es que te interesara?

Un abrazo muy cariñoso y que descanses durante las vacaciones de Semana Santa, que ya están cerca.

[19/04 12:49] Participant 101
ACLARACIÓN
Hola Óscar Urmeneta Maestu,
pues justo ayer me lo dijo …. y estaba pendiente de escribirte porque sí que estaba descontando. Me debí copiar mal las instrucciones o pensé que eran las mismas para el test individual que para el de grupo. Me queda uno por hacer este curso y lo tendré en cuenta.
Disculpa las molestias y muchísimas gracias por la aclaración.
Un saludo

[19/04 12:56] Óscar Urmeneta Maestu
Hola Participant 101. A lo mejor el problema es que yo no lo dejé del todo claro.
En tu feedback de la tercera unidad, más que que me cuentes cómo te ha ido en esta unidad en concreto, sería bueno que hicieras un breve balance de todo el curso sobre estos aspectos, aunque sea muy brevemente:

- ¿qué ventajas/inconvenientes le ves a esta metodología activa **para el aprendizaje del alumnado?**
- ¿qué dificultades/barreras encuentras tú para aplicarla en Bachillerato?
- ¿Cómo crees que te podría ayudar más y mejor?

Un abrazo muy grande!!!!

[11/05 13:29] Participant 101
Buenos días, Óscar Urmeneta Maestu
Pues ya he acabado de aplicar en clase la tercera unidad de TBL, la de la literatura del neoclasicismo. En esta ya no he descontado por los errores en el test individual con lo cual los resultados han sido un poco mejores en la clase que es más floja. La verdad es que en las otras dos clases que estudian mucho más y se preparan la materia, apenas he notado la diferencia. Esta vez les han sorprendido más las actividades de aplicación ya que eran un poco más diferentes a las unidades anteriores y se les pedía elaborar ellos reflexiones y además valorar las de sus compañeros por lo que creo que el trabajo ha sido más completo.

[11/05 13:48] Participant 101
FEEDBACK GLOBAL
Buenas de nuevo Óscar Urmeneta Maestu,
Como balance de todo el curso, el primero en el que aplico TBL, te comento algunas cuestiones:

- Las **ventajas/inconvenientes** de esta metodología activa para el aprendizaje del alumnado:
    - **Ventajas:** Aumenta la motivación y la participación activa del alumnado en clase (deja de ser mero espectador para convertirse en protagonista del proceso de enseñanza-aprendizaje); en parte por la competitividad que fomenta indirectamente; aprendizaje más significativo y duradero, y por otro lado por no quedar mal de cara a sus compañeros/as que luego les valoran. Incluso el alumnado que normalmente trabaja poco o no estudia consigue alcanzar unos objetivos mínimos debido a la implicación a la que "se ve obligado" en esta metodología y consigue una nota aceptable.
    - **Inconvenientes**: Comentando con la coordinadora de calidad los resultados de las encuestas de satisfacción en las que se les preguntaba expresamente por este método de aprendizaje, muchos han manifestado que se les ha hecho muy

pesado que lo hayamos aplicado en tantas materias y que estaban ya cansados de lo mismo. Además, a una parte del alumnado le resulta poco atractiva la idea de estudiar previamente los materiales que se les facilitan por su cuenta y, por tanto, no empiezan las primeras sesiones con la preparación necesaria (aunque esto ha ido mejorando de un TBL a otro).

- ¿Qué **dificultades/barreras** encuentras tú para aplicarla en **Bachillerato**?
    - Hay alumnos/as que consideran que trabajan mejor y obtienen mejores resultados trabajando de forma individual.
    - Además considero que me funciona muy bien con algunas unidades (literatura, diversidad lingüística) pero con otras me sería imposible trabajar así (gramática, sintaxis...)
- ¿Cómo crees que te podría **ayudar más y mejor**?
    - La realidad es que no tengo ninguna carencia de falta de ayuda por tu parte, al contrario, agradecidísima de lo pendiente que has estado desde principio de curso tanto en Madrid como luego del seguimiento por Teams.
    - Sería interesante que se obligara de alguna forma (metiéndolo en calendario de cada centro) el tener una reunión a principio de curso y otra al final de todos los profesores que impartimos TBL por pautar los momentos, consensuar criterios, evaluar qué nos ha funcionado y qué no...y que los alumnos vean que trabajamos todos de la misma manera y que es algo de centro.
    - De cara al curso próximo, sería bueno que por materias o ramas, nos llegaran otros TBL de nuestras asignaturas para poder coger ideas, innovar...

[11/05 14:04] Óscar Urmeneta Maestu
Hola Participant 101. Muchísimas gracias por tu feedback tan completo!!!!! Solo un comentario: esto es una comunidad de aprendizaje y, como tal, todo queda compartido. Todas las unidades creadas por esta comunidad (casi 150 en este primer curso) están archivadas en una carpeta que se actualiza constantemente conforme entregáis unidades nuevas y que está organizada por asignaturas (ver imagen abajo). Está en esta misma comunidad en el canal General>archivos. Este es el link:XXXXX. Ahí encontrarás unidades incluso de temas que te parecen más difíciles como sintaxis.
Enhorabuena por tu estupendo trabajo, tu compromiso y tu profesionalidad. Ya sabes que yo estaré aquí para todo lo que quieras y cuando quieras. No cierro en verano mmm, aunque a lo mejor sea más lento respondiendo. Si decides adelantar algo del curso que viene antes o durante las vacaciones, aquí estaré disponible.
Un abrazo enorme mucho, mucho ánimo para este final de curso.

[11/05 14:29] Participant 101
Perfecto, Óscar Urmeneta Maestu
Es cierto que comentaste en Madrid que existía esta comunidad de aprendizaje pero no sabía que estaban ya disponibles.
Un saludo

Appendix 4: sample of the first draft of a TBL lesson plan with feedback

1. TÍTULO DE LA UNIDAD *(cinco horas)*

HISTORIA, PROGRESO Y JUSTICIA

2. VALOR DE LA UNIDAD EN LA EVALUACIÓN

10% (1 punto) **Muy bien**

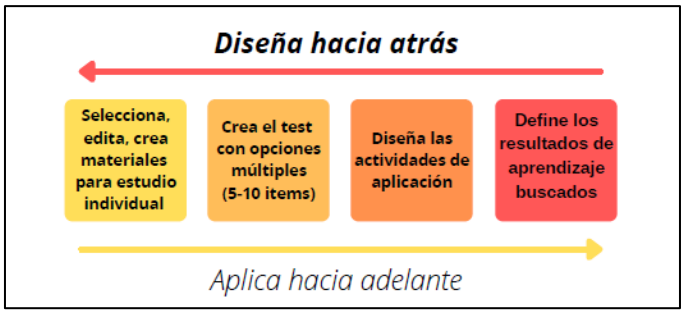
3. VALOR DE CADA PARTE DE LA UNIDAD

- Test individual: 0'4
- Test en equipo: 0'2
- Actividades de aplicación: 0'4

OK

4. FORMAR LOS EQUIPOS

Indispensable: - Creados por el profesor, nunca por los alumnos. - Tamaño: 4-5 alumnos. - Estables: los mismos para el curso/trimestre. - Homogéneos entre sí. - Siempre colocados en el mismo lugar y nunca de espaldas a la pizarra/pantalla.	**Ejemplos de criterios**: - Trayectoria académica y capacidades; - Predisposición personal al trabajo en equipo (anteriores experiencias…) - Personalidad (flexibilidad, capacidad de escucha, timidez, etc.) - Lazos afectivos (evitarlos o controlarlos);
EQUIPO 1: XXXXXXXXXXXXXXXXX **EQUIPO 2: YYYYYYYYYYYYYYYYY** **EQUIPO 3: ZZZZZZZZZZZZZZZZZZ** **EQUIPO 4: HHHHHHHHHHHHHHHHH** **Perfectos.**	



5. DEFINIR LOS RESULTADOS DE APRENDIZAJE DESEADOS

5.1 Identifica el contenido teórico que debe abarcar la unidad:

1. Memoria, historia, olvido. Problemas centrales de la historia.
2. ¿Sentido?
3. ¿Progreso?

4. Justicia: sentimiento, exigencia, virtud, lucha e institución.

5.2 Define los resultados de aprendizaje de la unidad:

- Lo que quieres que tus alumnos **sean <u>capaces de hacer</u> con la teoría** al final de la unidad.
- Utiliza la **taxonomía de Bloom** seleccionando el nivel de aprendizaje y luego los verbos.
- **Consejos prácticos** para redactar resultados de aprendizaje:
  - Comienza cada resultado de aprendizaje con un verbo de acción;
  - Evita verbos vagos como conocer, saber, entender, comprender…;
  - Usar verbos que lleven a acciones observables y medibles, que se pueden evaluar;
  - Aprovecha los **criterios de evaluación** (y los estándares de aprendizaje)
  - Que no sean muchos (¿4-5?)

1º Poder abordar con claridad con otra persona los principales problemas filosóficos de la historia.
2º Aplicar personalmente alguno de los puntos principales tratados a nuestra situación concreta y actual.
3º Evaluar críticamente, desde el contenido estudiado, una situación histórica real, extraída de los medios de comunicación.
4º Crear un artículo de opinión sobre la idea de progreso o sobre algún aspecto de la de justicia a partir de situaciones actuales vividas por los alumnos.
Estupendo. El último es muy potente.

6. CREAR LAS ACTIVIDADES DE APLICACIÓN 4S

- Deben abordar **TODOS** los resultados de aprendizaje deseados.

CARACTERÍSTICAS DE UNA BUENA ACTIVIDAD DE APLICACIÓN

1.- SITUACIÓN : SIGNIFICATIVA para el alumno, que le permita encontrar sentido a la teoría porque la ve vinculada con **el mundo real**, con su contexto (vivir, experimentar la teoría)

- *Como futuro especialista (más fácil en CCFF o en la Universidad)*
- *Con su contexto vital (académico o **vida normal**)*

2.- PROBLEMA: MÁS PRÁCTICO QUE TEÓRICO, que pida poner el conocimiento al servicio de la acción para solucionar algo que el alumnado se va a encontrar/se ha encontrado ya

- *Tiene que pedir justificar (es bueno que todos los alumnos escriban los argumentos)*
- *Mas que buscar la opción correta, es buscar la **mejor opción** (evaluar)*
- *A ser posible, preferir un curso de acción frente a otros*

3.- OPCIONES: PLAUSIBLES EN LA MEDIDA DE LO POSIBLE (para que hagan pensar y dudar)

- *A ser posible, que expresen modos de proceder (hacer algo tras aplicar la teoría)*
- *Cuanta menos información, mejor (más tendrán que aportar los alumnos)*
- *Pueden ser 4 (A, B, C, D) o 5 (A, B ,C, D, E)*

Empieza cada actividad identificando el (los) resultado(s) de aprendizaje que aborda

1ª.- (Resultado de aprendizaje 1º) Un amigo tuyo cuenta una historia de algo que os sucedió hace mucho tiempo. ¿Pueden sus recuerdos ser diferentes a los tuyos? ¿Por qué? ¿Cambiaría la historia si la contara una mujer o alguien de una edad diferente? Razona las respuestas.

Esta actividad tiene 2 dificultades:

- **Hace varias preguntas al mismo tiempo, por lo que posiblemente debería tener varias partes.**
- **No tiene estructura 4S, es decir, no ofrece opciones específicas (a, b, c, d, e) de entre las que el equipo tenga que justificar su preferencia por una. Recuerda que la clave es que, en algún momento, la actividad ofrezca opciones específicas de entre las que hay que elegir.**

2ª.- (Resultado de aprendizaje 2º) Si preguntases a tus abuelos o padres si ellos vivían mejor o peor cuando eran jóvenes, ¿qué crees que te contestarían? ¿Crees que vas a vivir mejor que ellos cuando llegues a su edad? Razona las respuestas.

Le ocurre lo mismo que a la anterior. Además, me da la impresión de que en esta actividad no hay respuesta correcta y todo depende de la calidad de los argumentos. Para valorarlos, podrías tener en cuenta en qué medida saben utilizar y sacar rendimiento a lo aprendido en la teoría.

Esta actividad, por ejemplo, se podría estructurar de esta manera:

Si preguntases a tus abuelos o padres si ellos vivían mejor o peor cuando eran jóvenes,

Justifica qué crees que te contestarían
a) mejor
b) peor

Justifica cómo crees que vas a vivir cuando llegues a su edad

a) mejor que ellos
b) peor que ellos

3ª.- (Resultado de aprendizaje 3º) https://www.eldebate.com/opinion/en-primera-linea/20230405/memento-mori-joven-woke_105590.html

Este artículo es muy interesante, y yo conozco personalmente al autor,…….. No obstante, aquí todavía no hay actividad. ¿Cuál sería la pregunta que deben responder los equipos y cuáles las opciones entre las que tienen que elegir?

4ª.- (Resultado de aprendizaje 4º) Crea un artículo de opinión o disertación a partir de la siguiente cuestión: *¿Contribuye el desarrollo tecnológico y sus aplicaciones al progreso de la humanidad?*

¿Sería bueno establecer un límite de tiempo y de extensión, para que tengan una referencia?
Por otra parte, ¿cómo se va a fomentar la discusión entre equipos? Sería necesario que estructuraras la actividad en tres partes: creación, evaluación y luego decisión sobre el equipo que mejor disertación ha escrito, a ser posible a la luz de cómo aplican lo aprendido en la teoría.

7. CREAR EL TEST *(normalmente 10 ítems de 4 opciones)*

7.1 Distribuir los 10 ítems en cada nivel de aprendizaje

Mejor recordar (5), entender (3) y aplicar (2). Alguna pregunta en negativo (**NO**…).

CONTENIDOS	Recordar	Entender	Aplicar
Memoria, historia, olvido. Problemas centrales de la historia.	1	2	5
¿Sentido?	3	4	

¿Progreso?	6	7	9
Justicia: sentimiento, exigencia, virtud, lucha e institución.	8 y 10		

7.2 Test

- Es crítico garantizar un buen resultado para todo el que ha estudiado - Conviene que haya algún ítem más difícil para que provoque discusión en el test de equipo; - Tienen que abordar contenidos fundamentales, lo mínimo para seguir aprendiendo con AA; - Muy bien escrito, con gramática consistente entre pregunta y respuesta; - Fácil de entender, resaltando los matices en negrita o mayúsculas; - Que haya solo una opción correcta y sea clara o claramente mejor; - Que las opciones sean plausibles para no dar pistas a los que no han estudiado; - Que la largura de las opciones sea similar; - Ordenar la respuesta correcta al azar, variar su posición; - Si se hace online, que el orden de las preguntas y las respuestas sea al azar; - Que no haya preguntas que dependan entre sí dentro del test;
1.- El libro *Memoria, historia, olvido* es de: a) Walter Benjamin. b) Paul Ricoeur. c) Augusto Comte. d) Jean Jaques Rousseau. 2.- Evitar la manipulación es uno de los problemas centrales de la historia y significa: a) Mantener vivo el recuerdo de aquellos que nos precedieron. b) Transmitir sesgadamente la memoria de los acontecimientos. c) Evitar las historias oficiales, encaminadas a la exaltación del poder. d) Evitar la propia responsabilidad en los hechos acontecidos. 3.- Comprender el sentido de la vida humana consiste en buscar respuesta a dos preguntas fundamentales de las cuatro que plantea Kant: a) ¿quiénes somos? y ¿qué podemos esperar? b) ¿quiénes somos? y ¿qué puedo conocer? c) ¿qué debo hacer? y ¿qué podemos esperar? d) ¿qué debo hacer? y ¿qué puedo conocer? 4.- La cuestión ¿de dónde venimos? nos lleva a preguntarnos por: a) El destino de la humanidad. b) ¿Qué nos es lícito esperar? c) El origen del universo, de la especie humana y de la sociedad. d) Ninguna de las anteriores cuestiones. 5.- ¿Qué debe hacer alguien de tu edad para contribuir a la memoria de nuestro tiempo?: a) Olvidar los acontecimientos. b) Echar a perder la memoria. c) Manipular los recuerdos. d) Escribir un diario. 6.- La idea de progreso se debe a: a) Empédocles. b) Platón. c) Agustín de Hipona. d) Nietzsche. 7.- El eterno retorno significa: a) Vivir intensa y plenamente cada momento como si todo fuera a repetirse eternamente. b) La sucesión de edades de la humanidad, desde las oscuras a la de oro, y vuelta a empezar.

c) Pasar cíclicamente del equilibrio y la armonía del cosmos al desequilibrio y caos.
d) La historia es lineal y la humanidad avanza hacia un estado de perfección.

8.- Platón propone la justicia como:
a) Afirmación de la libertad individual.
b) Garantizar el mayor bienestar posible para el mayor número de personas.
c) El equilibrio de las dimensiones del ser humano y de las clases sociales fundamentales.
d) Todas las opciones anteriores son válidas.

9.- De las siguientes prácticas actuales, no son consideradas como progreso de la humanidad:
a) Las personas ahora se trasladan en coches, trenes o aviones.
b) Antes no existían teléfonos móviles ni redes sociales.
c) La humanidad posee ahora medicinas más eficaces.
d) Antes, las personas comían más alimentos cocinados en casa que ahora.

10.- Para conseguir una sociedad más justa, no hace falta:
a) Comparar las distintas formas de justicia y comportamiento de las personas.
b) No hacer propuestas de cambios que corrijan las injusticias presentes y amplíen los espacios de justicia en las sociedades reales.
c) Aceptar que las soluciones son siempre parciales y provisionales.
d) Ninguna de las opciones anteriores.

Perfecto

8. SELECCIONAR/EDITAR MATERIALES PARA TRABAJO INDIVIDUAL

Muy bien enfocados, adaptados para el trabajo individual y midiendo muy bien el tiempo para no saturar al alumnado.

Materiales (recomendable de distintos tipos):
Libro del alumno 1º Bto. Filosofía (pp. 204-213). (80')
Fragmento de *Discurso sobre las ciencias y las artes* (J. J. Rousseau). (10')
Fragmento de película *"Danton"* (A. Wajda, 1982). (10')

Tiempo estimado de preparación en casa:
100 minutos.

OK. Trata de averiguar indirectamente mientras la aplicas si el tiempo dedicado excede esos 100 minutos o les ha parecido a ellos excesivo, por si para el curso que viene hay que editar algo el contenido del libro para facilitar su estudio.

Appendix 5: progressive evolution of the coding framework for self-reported TBs

CATEGORIES	PROPERTIES	SUB-DIMENSIONS	DIMENSIONS	Quantisation of codes
Evolution of self-appraisal	**Evolution of belief orientation predominance**	**Evolution of the difference CO-BO/BO-CO**	**Evolution of the CO**	
Significantly more constructivist	CO becomes predominant Inferior CO equals BO			4
More constructivist	CO remains predominant BO remains predominant	CO-BO increases BO-CO decreases	increases	3
Reinforced constructivist	CO remains predominant	CO-BO is the same	Increases	2
Slightly more constructivist	CO remains predominant CO remains predominant BO remains predominant	CO-BO increases CO-BO decreases BO-CO decreases	Same Increases Same/inferior	1
Stable	CO remains predominant BO remains predominant	CO-BO is the same BO-CO is the same	Same/inferior	0
More behaviourist	CO remains predominant BO remains predominant	CO-BO decreases BO-CO increases	Same/decreases	-1
Significantly more behaviourist	BO becomes predominant Inferior BO equals CO			-2

Table 3: coding framework for the evolution of teachers' self-appraisal of their TTBs

CATEGORIES	PROPERTIES Evolution in the predominance of belief orientation	SUB-DIMENSIONS Evolution of the difference between belief orientations	DIMENSIONS Evolution of the CO	Quantisation of categories
More constructivist	CO becomes predominant Inferior CO equals BO CO remains predominant CO remains predominant BO remains predominant	 CO-BO increases CO-BO is the same BO-CO decreases	 Increases increases	2
Slightly more constructivist	CO remains predominant CO remains predominant No predominance BO remains predominant	CO-BO increases CO-BO decreases BO-CO decreases	Same Increases Increases Same/inferior	1
Fairly stable	CO remains predominant No predominance BO remains predominant	CO-BO is the same BO-CO is the same	Same/inferior Same 	0
More behaviourist	CO remains predominant No predominance BO remains predominant BO becomes predominant Inferior BO equals CO	CO-BO decreases BO-CO increases 	Same/decreases Inferior 	-1

CATEGORIES	PROPERTIES	DIMENSIONS	Quantisation of codes
Nature of the evolution of self-appraisal	**Evolution of the CO**	**Evolution of the relationship CO-BO**	
More constructivist self-appraisal	Higher CO	A positive difference with BO increases A negative difference with BO decreases	4
		Same difference with BO	3
Stable self-appraisal	Higher CO	A positive difference with BO decreases A negative difference with BO increases	2
	Same CO	A positive difference with BO increases A negative difference with BO decreases	1
		Same difference with BO	0
More behaviourist self-appraisal	Same CO	A positive difference with BO decreases A negative difference with BO increases	-1
	Lower CO	No matter relationship with BO	-2

CATEGORIES	PROPERTIES	DIMENSION	Quantisation
	Level of belief orientations concerning baseline	**Consistency across the 3 measurements**	
Adaptive change	Higher CO	After year 1 and year 2	2
Slightly adaptive change	Higher CO	After year 2 only	1
	CO remains at the maximum level	After year 2	
Resistance to change	Same CO Lower CO and lower BO	After year 2	0
Maladaptive change	Lower CO and same/higher BO	After year 2	-1

CATEGORIES	PROPERTIES	DIMENSION	Quantisation
	Level of belief orientations concerning baseline	**Consistency across the 3 measurements**	
Adaptive change	Higher CO	After year 1 and year 2	2
Slightly adaptive change	Higher CO	After year 2 only	1
	CO remains at the maximum level	After year 2	
No change	Same CO Lower CO and lower BO	After year 2	0
Maladaptive change	Lower CO and same/higher BO	After year 2	-1

Appendix 6: reliability test of my analysis of the quality of lesson plans

Critical friends were 4 teachers being institutionally trained to become prospective mentors of TBL within the community of practice by practising the evaluation of the quality of 3 TBL lesson plans created by some of the participants in this research (one lesson plan per term during year 1). As in the analysis of the first lesson plan, which was different for all of them, critical friend 1 was significantly misaligned with my evaluation, I decided that critical friends 2, 3, and 4 evaluate that very lesson plan in their second analysis. The comparison across the whole training process showed that the evaluation of all 4 critical friends virtually overlapped mine in all the aspects that are relevant for the feedback on TBL lesson plans that prospective mentors within the wider institutional educational change effort should give in the future.

			CRITICAL FRIENDS											
			1	2	3	4	1	2	3	4	1	2	3	4
Quality of the TBL lesson plan	Quality of student learning outcomes	High	X		X	X	X	X	X	X	X	X	X	X
		Improvable		X										
		Low												
	Quality of application activities	High				X								
		Improvable	X	X	X		X	X	X	X				
		Low									X	X	X	X
	Quality of tests	High	X	X	X	X	X	X	X	X	X	X	X	X
		Improvable												
		Low												
	Quality of resources	High	X	X		X		X	X	X	X	X	X	X
		Improvable			X		X							
		Low												
	Internal coherence bertween parts	High	X		X	X	X	X	X	X				
		Improvable		X							X	X	X	X
		Low												
Difficulties to create the plan	Type of amendments required	Major					X				X	X	X	X
		Minor,	X	X	X			X	X	X				
		None/incidental				X								
			First lesson plan (different for each critical friend)				Second lesson plan (same for all 4 critical friends)				Third lesson plan (same for all 4 critical friends)			

X = my evaluation
Colour = evaluation of critical friends
alignement
misalignment

Comparison of my analysis of the quality of lesson plans with that by the 4 critical friends

Appendix 7: development of the framework for enacted TBs with the help of critical friends

Intial draft

	Aspects of lesson plans concerning the CO	Aspects of lesson plans concerning the BO
1	Student learning outcomes are well defined in terms of skills or competencies	Student learning outcomes refer to theoretical content
2	Classroom activities are challenging and foster the development of skills	Classroom activities address relevant theoretical content
3	Classroom activities are aligned with the skills defined in the learning outcomes	Classroom activities address all the content referred to in the learning outcomes
4	Classroom activities make the content significant for students by linking it to their context and experiences	The test to measure the assimilation of content before classroom activities is well designed
5	Classroom activities are well designed to require teamwork and collaboration	Resources to prepare the test have been well specified
6	Assimilation of content is sought through the development of competencies	There is a strong emphasis on the transmission of content

Second draft

	Aspects of lesson plans concerning the CO	Aspects of lesson plans concerning the BO
1	Student learning outcomes are well defined in terms of skills or competencies	Student learning outcomes refer to theoretical content
2	Classroom activities are challenging and foster the development of skills	Classroom activities address relevant theoretical content
3	Classroom activities are aligned with the skills defined in the learning outcomes	Classroom activities address all the content referred to in the learning outcomes
4	Classroom activities make the content significant for students by linking it to their context and experiences	The test to measure the assimilation of content before classroom activities is well designed
5	Classroom activities are well designed to require teamwork and collaboration	Resources to prepare the test have been well specified
6	There is an interest in students developing and deepening their understanding through their experience when applying content	There is a strong emphasis on the transmission of content to students

Third draft

	Aspects of lesson plans concerning the CO	Aspects of lesson plans concerning the BO
1	Student learning outcomes are well defined in terms of skills or competencies	Student learning outcomes refer to theoretical content
2	Classroom activities are aligned with the skills defined in the learning outcomes	Classroom activities address relevant theoretical content
3	Classroom activities make the content significant for students by linking it to their context and experiences	Classroom activities address all the content referred to in the learning outcomes
4	Classroom activities are challenging and require a complex application of the content addressed in the test	The test preceding classroom activities measures the assimilation of the content addressed by the learning outcomes
5	Classroom activities are designed to require teamwork and peer feedback	Resources to prepare the test have been well specified
6	There is an interest in students developing and deepening their understanding through their experience when applying content	There is a strong emphasis on the transmission of content to students

Fourth draft

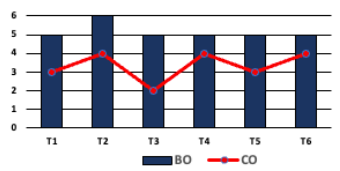
	Aspects of lesson plans concerning the CO	Aspects of lesson plans concerning the BO
1	Student learning outcomes are well defined in terms of skills or competencies	The teacher has identified the blocks of theoretical content addressed by the plan
2	Classroom activities are aligned with the skills defined in the learning outcomes	Student learning outcomes address all the blocks of theoretical content identified for the plan
3	Classroom activities make the content significant for students by linking it to their context and experiences	The test for individual pre-class study addresses all the theoretical content addressed in the learning outcomes
4	Classroom activities are designed to require collaboration and peer feedback	All the content referred to in the learning outcomes is addressed by classroom activities
5	Classroom activities are challenging and require that students develop and deepen their understanding through their experience when applying content	Resources are not adapted, edited, or created to limit the amount of content for the individual pre-class study to the fundamental concepts

Appendix 8: tool for tracking participants individually from all 3 perspectives on TBs

Gender	Male
Discipline	Others
Experience	32
ype educacation	Baccalaureate
School	1

Final decision arfter individual tracking of evolution of TBs from the 3 perspectives (Hover on cells to see notes with the a priori coding frameworks)					
Change in self-reported TBs		Change in implied TBs		Change in enacted TBs	
No change	0	Slighly adaptive	1	No change	0

PERSPECTIVE 1: Evolution of self-reported TBs	CO	BO	CO-BO
Baseline	5,83	5,50	0,3
After year 1	6,00	4,67	1,3
After year 2	5,67	4,17	1,5
Baseline-year 2	-0,2	-1,3	



PERSPECTIVE 2: Evolution of enacted TBs

	CO	BO	Comments after the last revision	Lesson plan 1
1	1	1	OK	Microsoft Word Document
2	1	1		
3	X	1		
4	X	1		
5	X	1		
6	1	X		
	3	5		

	CO	BO	Comments after the last revision	Lesson plan 2
1	1	1	OK	Microsoft Word Document
2	1	1		
3	1	1		
4	1	1		
5	X	1		
6	X	1		
	4	6		

	CO	BO	Comments after the last revision	Lesson plan 3
1	X	1	OK	Microsoft Word Document
2	X	1		
3	X	1		
4	1	1		
5	X	1		
6	1	X		
	2	5		

	CO	BO	Comments after the last revision	Lesson plan 4
1	1	1	Resources were adapated and selected for pre-class individual study.	Microsoft Word Document
2	1	1		
3	X	1		
4	1	1		
5	X	1		
6	1	X		

PERSPECTIVE 3: Evolution of implied TBs

Narrative account

Microsoft Word Document

Pieces of evidence

1 Slightly adaptive

Engagement:	termly reflections
Newness of TBL:	familiar

"Esta jornada me está sirviendo, para evolucionar en mi percepción de las metodologías activas. Si bien ya mi práctica docente se encamina hacia ellas desde hace años (Ap Cooperativo, Proyectos,..) , estas jornadas me han servido para puntualizar aspectos que pensaba eran correctos pero que se pueden mejorar y mucho"

Emotions:	positive

" Les gustó, me gustó y aprendieron ".
"En resumen, está siendo una experiencia positiva a nivel de formación y de aplicación práctica".
"Por lo demás me encuentro cómodo con esta metodología".
"El balance es muy positivo porque es una metodología que además de ser operativa, se presta especialmente para Filosofía. "

Pros/cons:	more advantages

"Yo como inconveniente le veo la gestión del tiempo, sobre todo en cursos tan "apurados" como 2º de bachillerato y que es más difícil concretar en que medida quedan consolidados algunos contenidos conceptuales. Sin embargo todo lo demás son ventajas, están más motivados y con menos tensión por la nota. Aprenden un "plus" de escucha, debate y consenso. Incluso fueron

Prospect:	maintaining

"... con el paso del tiempo y con una mayor formación por mi parte, mi intención es utilizar el TBL de manera regular y desarrollar mi docencia en el área de Filosofía con esta metodología".
After having creating and piloting 6 TBL units: "En cuanto a las unidades, mi intención es ir mejorando las que ya tengo elaboradas. "

1 2 4 15 23 24 25 46 48 49 50 51 71 72 73 74 100 101

Appendix 9: holistic view on participants based on quantifying the type of change

	DEMOGRAPHIC VARIABLES						TTBs variables		
Participant	Gender	School	Exam	Discipline	Huberman's career stage	Years of teaching experience	Sel-reported TTBs	Implied TTBs	Enacted TTBs
1	2	1	1	2	5	32	0	1	0
2	1	1	1	1	2	6	0	2	2
4	2	1	1	2	3	17	0	2	2
15	1	1	1	2	5	33	0	1	2
23	1	2	1	2	4	20	0	1	2
24	1	2	1	2	3	8	1	0	1
25	2	2	1	1	4	29	2	1	1
46	2	3	1	1	2	6	1	0	0
48	2	3	1	2	2	4	0	1	2
49	2	3	1	1	3	16	2	1	1
50	1	3	1	2	3	9	1	2	1
51	2	3	1	1	4	23	1	2	2
71	2	4	1	1	3	10	0	1	1
72	1	4	1	2	3	10	2	-1	0
73	2	4	1	2	3	10	-1	-1	0
74	2	4	1	2	1	3	0	-1	1
100	2	5	1	2	3	13	1	2	0
101	1	5	1	2	3	15	1	2	0
103	1	5	1	1	4	19	1	-1	0
104	1	5	1	1	4	25	-1	-1	0
105	1	5	1	1	5	35	1	1	1
106	1	5	1	1	4	30	1	2	0
107	1	5	1	2	5	31	0	-1	0
131	2	6	1	2	4	26	2	0	0
133	2	6	1	1	4	21	2	1	2
134	1	6	1	2	4	24	2	-1	-1
136	1	6	1	1	3	12	0	1	2
137	1	6	1	2	4	20	-1	1	1
138	2	6	1	1	2	6	0	-1	0
155	1	6	1	2	3	15	-1	1	0
158	1	7	1	1	1	3	-1	0	1
160	2	7	1	2	2	5	1	2	2
174	1	7	1	2	3	22	0	-1	0
188	1	8	1	2	3	17	0	1	0
189	2	8	1	1	5	32	2	2	0
190	2	8	1	2	2	6	0	1	2
191	1	8	1	1	3	8	0	-1	-1
192	2	8	1	1	1	3	1	2	0
199	2	8	1	2	2	4	2	2	0
205	1	9	1	2	3	13	1	1	0
206	2	9	1	2	1	3	1	-1	0
207	2	9	1	2	3	16	2	2	0
208	1	9	1	2	4	23	2	1	1
209	1	9	1	2	4	20	0	-1	0
210	2	9	1	2	3	15	2	-1	-1
211	1	9	1	2	3	7	-1	2	0
231	1	10	2	2	3	10	2	2	2
234	1	10	2	1	4	28	0	1	0
235	1	10	2	2	4	21	0	1	2
248	1	10	2	2	3	13	-1	-1	-1
252	2	11	2	1	3	12	0	1	2
253	1	11	2	2	4	21	1	1	2
254	1	11	2	2	3	14	2	2	1
255	2	11	2	2	4	21	-1	2	0
256	1	11	2	2	3	10	-1	2	2

Appendix 10: sample of the coding stripes of participant 12

Files\\Participant 12 - § 1 reference coded [100.00% Coverage]
Reference 1 - 100.00% Coverage
YEAR 1

[04/10/2022 17:51] Participant 12
Hola Óscar!!

[04/10/2022 17:54] Participant 12
Mi reflexión sobre lo que qué creía antes y lo que creo ahora es lo siguiente: venía con mucha ilusión ante aprender a usar esta metodología de la que los compañeros que ya la usaban me habían hablado bastante bien, por lo que las expectativas eran buenas. Pero por otro lado, venía con la "inquietud" de cómo aplicar esta metodología en 2º de bachillerato en donde la presión de preparar a los alumnos para la EVAU es grande y el tiempo muy justo ya que los contenidos a impartir son muy extensos. Después de estar preparando la unidad didáctica durante estas sesiones hasta ahora, he tenido varias sensaciones:

[04/10/2022 18:01] Participant 12
He disfrutado mucho preparándola (entre otras cosas porque la he hecho de mi especialidad, la Física), se me ha pasado el tiempo muy rápido, ya que me ha permitido profundizar en la preparación de unos contenidos importantes para los alumnos de una forma distinta a lo habitual, lo que hará que tanto yo como los alumnos disfruten de la experiencia de una docencia distinta.
Después de preparar el borrador (pendiente de revisión y feedback) me he dado cuenta de que puedo tener un equilibrio entre impartir los contenidos de la asignatura de una forma distinta y más significativa y práctica para los alumnos y DE SEGUIR PREPARÁNDOLOS PARA LA EVAU con unos determinados items tanto del iTest como en las actividades de aplicación. Creo que con una buena planificación de las clases durante todo el curso académico, podré impartir algunas sesiones con TBL sin que eso me suponga una "pérdida de calidad" en la preparación a la EVAU, cosa que me preocupaba bastante. Después de esta primera unidad didáctica (y con el tiempo y la experiencia mejorará) me he quitado bastante de este miedo que tenía.
[04/10/2022 18:02] Participant 12
Gracias por todo lo que has compartido con nosotros, de una forma amena, didáctica y muy clara. Creo que le he pillado el tranquillo a lo que es la filosofía general y, a partir de ahora, a mejorar con la experiencia del día a día y con el feedback que recibiré de tu parte y seguro que también de los compañeros.
(1 liked)

[04/10/2022 18:02] Participant 12
Un abrazo!!

[04/10/2022 19:43] Participant 12
[FÍSICA 2º BACHILLERATO TBL Unidad Didáctica CAMPO GRAVITATORIO.docx]

[04/10/2022 19:44] Participant 12
Hola de nuevo, Óscar!! Aquí tienes la unidad didáctica que he preparado a la espera de tu feedback. Sin prisa porque tendrás muchas que revisar así que con tranquilidad. Gracias por todo!!!!! Un abrazo y seguimos en contacto!!

[08/10/2022 17:00] Óscar Urmeneta Maestu
Hola Participant 12. Muchas gracias por tu primera unidad TBL! Está estupenda. Como tú dices, creo que



has cogido perfectamente la filosofía no solo de TBL sino también del planteamiento de utilizarlo no siempre, sino cuando nos pueda venir bien, que dependiendo de la asignatura y del curso, puede cambiar. Enhorabuena. Te hago algún pequeño comentario, pero son cosas muy menores. Está perfectamente preparada para ser aplicada. No obstante, si introduces alguna mejora, vuelve a compartir la unidad para que yo guarde la mejor versión.
¿Cuándo tienes intención de aplicarla? Recuerda evitar que coincida con fechas muy cercanas a los exámenes de evaluación. Ya me contarás cómo te ha ido.
Un abrazo muy muy grande y gracias por todo,
Oscar.
(1 liked)
[Campo gravitatorio. Feedback.docx]

[25/10/2022 18:24] Participant 12
Hola!! Muchas gracias por el feeback!! Espero que vaya todo bien. Ya te contaré. La previsión para realizarla es para finales de noviembre - principios de diciembre, justo después de los exámenes de la 1ª evaluación de 2º de bachillerato. Gracias de nuevo por todo y un fuerte abrazo!!!

[26/10/2022 07:22] Óscar Urmeneta Maestu
Fabulosas fechas. Un abrazo enorme para ti!!!
[13/12/2022 06:58] Óscar Urmeneta Maestu
Buenos días Participant 12. Espero que todo te vaya bien y tengas fuerzas para las pocas clases que quedan antes de vacaciones de Navidad.
¿Terminaste de aplicar tu primera unidad TBL? Si así fuera, ¿podrías compartir brevemente conmigo cómo te fue, qué te gusto, qué te gusta de TBL para incorporar a tu práctica docente?
Un abrazo enorme y muchas gracias por tu compromiso.

[10/01 15:39] Participant 12
Hola Óscar!! Lo primero disculpas por no haber podido contestarte antes. Antes de vacaciones de navidad nos surgieron bastantes "incendios" que hubo que apagar en esos momentos y absorbieron bastante de nuestro tiempo. Sobre la realización de la unidad didáctica decirte que la sensación que tuve, tanto yo como los alumnos, fue buena. La preparé para que fuese hecha en dos clases lectivas, ya que al ser Física de 2º de Bachillerato, entre la presión de la EVAU y la extensión del programa,, tanto yo mismo como los propios alumnos teníamos miedo de que nos ocupara un tiempo del que no se va sobrado en 2º de bachillerato. No obstante, también después de haberla realizado adaptando los tiempos de planificación de las clases, hemos podido comprobar tanto yo mismo como los alumnos que planificando y organizando bien los tiempos se puede llegar a realizar tanto la unidad TBL (con contenidos útiles para la EVAU) como los propios contenidos que te exigen en la prueba externa. Sobre los resultados obtenidos por los alumnos (que no han sido malos y en las actividades de aplicación surgieron varios debates interesantes que les hicieron profundizar de una forma distinta en lo que buscaba) sí que me ha llamado la atención (relativamente) que en el test, la media de los 15 alumnos fue de alrededor de un 7, pero en cambio, cuando lo hicieron en grupo, obtuvieron prácticamente un 10 los tres grupos. Esto me da pistas de que los grupos trabajaron bien entre ellos y se pusieron de acuerdo en las opciones correctas. El feedback que me dieron los alumnos cuando les pregunté sobre la dificultad de la unidad TBL fue positivo: no la consideraron difícil y podían hacer las cosas con los conocimientos que tenían. Bueno, esto es lo que te puedo decir sobre esta primera unidad. En el siguiente mensaje, te adjunto la 2ª unidad que haré con ellos con la misma filosofía: cuando terminen los exámenes de la 2ª evaluación, a modo de introducción del tema que empezaremos para la 3ª evaluación: CAMPO MAGNÉTICO. En la elaboración de esta unidad que he preparado durante las navidades sí que tuve "problemas" (bastantes pensamientos de los enunciados de las actividades de aplicación para relacionarlas con algo cotidiano hasta que consiguí



crearlas) debido a que este tema es bastante más abstracto que el de la unidad TBL anterior (CAMPO GRAVITATORIO) y conseguir enunciar unas actividades de aplicación algo adecuados me ha costado más. Espero que estén bien. Bueno, muchas gracias por todo y aquí te adjunto la nueva unidad TBL. Un fuerte abrazo!!!!

[10/01 15:55] Óscar Urmeneta Maestu
Hola Participant 12, feliz año.
Cómo me alegro de que la experiencia haya sido positiva. Enhorabuena, preparaste la unidad muy bien. Muchísimas gracias, también, por tu detallado feedback, es de enorme valor y me permite entender mucho mejor cómo ayudaros. Me gustaría comentarte 3 cosas.
Haces muy bien en no utilizar todas las horas de la semana para TBL. Yo, de hecho, uso TBL como método sistemático cada semana, pero me ocupa 2,5-3 horas de las 4 semanales. La otra, la dedico no a transmitir contenido sino a preparar el tipo de examen EVAU. De manera que TBL me permite 2 cosas: que el alumnado aprenda más y mejor, y otras cosas, y además ahorrar tiempo para preparar la EvAuU, tiempo que con la metodología tradicional no sabía sacar.
Respecto al test, muy bien el test individual. Eso significa que el nivel de dificultad estaba bien medido y el alumnado habrá aprendido que estudiar para ir preparado a clase el compensa no solo porque va a hacer mejor las actividades, sino porque la nota del test cuenta!. Es normal que el test en equipo tengan 9-10, y eso no está mal. Al contrario, de eso se trata. Lo que tienen que ver es que en equipo se pueden hacer las cosas mejor que individualmente, y ya solo con las discusiones del test aprenden un montón.
La estrategia del momento elegido para la unidad me parece perfecta, sobre todo vista la experiencia en la primera evaluación.
En breve te enviaré mi feedback sobre esta nueva unidad TBL.
Un abrazo muy muy fuerte!

[10/01 15:41] Participant 12
Hola de nuevo!! Como te he dicho en el anterior mensaje, aquí te adjunto para que revises la unidad TBL sobre CAMPO MAGNÉTICO para esta siguiente evaluación. Un fuerte abrazo!!
[FÍSICA 2º BACHILLERATO TBL Unidad Didáctica CAMPO MAGNÉTICO.docx]

[15/01 16:28] Óscar Urmeneta Maestu
Hola Participant 12. Adjunto te envío mi feedback sobre la segunda unidad que, de nuevo, es estupenda. Te hago sugerencias en 3 actividades y en varios items del cuestionario. Por supuesto, siéntete libre de hacer las modificaciones que consideres oportunas solo si te convencen, pues tú eres el especialista de la materia. No obstante, si haces algún cambio, vuelve a compartir la unidad par que pueda archivar la última versión.
¿Cuándo tienes pensado aplicarla? Cuando lo hagas, fíjate en hasta qué punto crees que es importante que las actividades conecten la teoría con la vida real del alumnado. Sería muy importante que en el feedback que me devuelvas explicando cómo te ha ido, reflexionaras un poco sobre eso.
Un abrazo enorme y suerte con ella. Ya me contarás.
[Campo magnético. Feedback.docx]

[30/01 15:41] Participant 12
Hola Oscar!! Gracias por tu feeback. Como siempre es muy útil y alguna cosilla sí que voy a modificar con algún comentario aque me has hecho. En cuanto tenga esas pequeñas modificaciones te vuelvo a adjuntar la unidad para que la puedas archivar. Tengo pensado hacerla exactamente igual que la de la primera evaluación, justo después de los exámenes de la 2ª evaluación y como introducción al primer tema de la 3ª evaluación. Estaré atento a lo que me comentas de la conexión con la vida real (incluso



puede que les pregunte a ellos directamente a ver qué les parece, ya que tengo unos cuantos alumnos y alumnas bastante maduros y buenos intelectualmente y con los que tengo bastante confianza, por lo que les preguntaré para que me den ellos también un feedback. Bueno, ya te contaré!! Gracias por todo y que vaya todo muy bien!! Un abrazo muy fuerte!!!

[30/01 16:13] Participant 12
Hola de nuevo!! Aquí te adjunto la unidad con alguna modificación según las sugerencias que me hacías en el feedback. Un fuerte abrazo!!

[30/01 17:31] Óscar Urmeneta Maestu
Archivada. Muchas gracias y mucho ánimo!!!!!
[27/03 07:24] Óscar Urmeneta Maestu
Buenos días Participant 12. Espero que todo vaya bien. Antes de que te vayas de vacaciones de Semana Santa, ¿podrías compartir conmigo las sensaciones con las que te quedaste después de aplicar la segunda unidad TBL?
Un abrazo muy grande y mucho ánimo, que ya queda poco para descansar.

[31/03 08:31] Participant 12
Hola Oscar!! Espero que todos estéis bien. Muchas gracias por todo tu apoyo y trabajo, nos da mucha confianza para seguir adelante. Sobre la realización de la segunda unidad TBL mis sensaciones fueron las mismas que en la primera, buenas en general, y refuté con mis alumnos (lo hablé directamente con ellos y me dijeron que así les ocurría en todas las asignaturas TBL) lo que ya comprobé con la primera unidad, y es que los resultados del iTest son peores que cuando lo hacen en grupo, pero de forma significativa, incluso me ha llamado la atención que alumn@s "buenos" no obtienen una nota demasiado elevada en el test individual. Como me llamó la atención esto me quedé un poco preocupado, pero hablé con ellos y me dijeron que esto es habitual en TBL, así como también me lo indicaste tú en el anterior Feedback, así que me quedé más tranquilo y así ya sé a lo que me enfrento en el resto de unidades que prepare. Temía que estuviera siendo yo demasiado exigente en la preparación del iTest, cuando realmente no tengo esa sensación cuando lo planifico. En cuanto a las actividades de aplicación, sí que estoy contento. Creo que les "enganchan" bastante al verlas conectadas con asuntos de la vida cotidiana que se pueden encontrar en cualquier momento. Además, surgen debates bastante interesantes durante la realización de las mismas, tienen que pensar y consensuar muchas cosas y también son muy útiles para mi para hacer alguna pequeñísima corrección sobre mis enunciados y propuestas de respuestas, así que perfecto, porque yo aprendo también con ellos, conforme vamos cogiendo experiencia. Bueno, lo dicho al principio, muchas gracias por todo y te deseo que pases unas buenas vacaciones y que puedas descansar. Un fuerte abrazo!!!!!

[31/03 08:32] Participant 12
PD: Durante estos días de vacaciones te enviaré la 3ª unidad que ya estoy elaborando. Otro abrazo!!!!

[03/04 06:53] Óscar Urmeneta Maestu
Buenos días Participant 12. Muchas, muchas, muchas gracias por tu feedback, pues me ayuda mucho a entender cómo os puedo ayudar más. Efectivamente, en el iTest los resultados son normalmente algo peores que en test en equipo. De esta manera no solo aprenden del equipo sino que aprenden que en equipo se pueden hace cosas que individualmente no se alcanzan. No obstante, esa diferencia no tiene por qué ser significativa. Fíjate en una cosa: los resultados del alumnado que tú sabes que han estudiado bien, ¿son bajos? Si así fuera, no descartes la hipótesis de que a lo mejor el test sea demasiado exigente. Lo que es clave es que no desmotive al alumnado a estudiar en casa antes, tiene que resultar gratificante para el/la alumno/a que haya estudiado bien, que se den cuenta de que le compensa estudiar antes porque les renta,



porque sacan buena nota en el test.
Estaré muy atento a este canal para devolverte mi feedback sobre de tu tercera unidad enseguida. Me imagino que ya estaréis de vacaciones. En Pamplona las cogemos el día de Jueves Santo y luego tenemos fiesta toda la semana de Pascua. Disfrutaaaaaaaa!!!!!!!!!!!!
[07/04 12:15] Participant 12
Hola Oscar!!

[07/04 12:17] Participant 12
Tal y como te indiqué en el anterior mensaje, aquí te adjunto la tercera unidad TBL para este curso. Descansa estos días (a vosotros os queda toda la semana que viene de vacaciones, nosotros ya las estamos terminando) que bien merecido lo tienes. Vamos hablando y un fuerte abrazo!!!
[FÍSICA 2º BACHILLERATO TBL Unidad Didáctica OPTICA GEOMETRICA.docx]

[12/04 08:13] Óscar Urmeneta Maestu
Buenos días Participant 12. Muchísimas gracias por tu tercera unidad TBL (última ya de este primer curso)!!!!!!!!
Está fenomenal. Creo que sigues el diseño inverso y que todo está perfectamente alineado para conseguir los resultados de aprendizaje. Me encanta cómo introduces las actividades para hacer la teoría significativa para el alumnado. Te hago algunas sugerencias mínimas por si las consideras oportunas. Si haces alguna modificación, vuelve a compartirla para que archive la versión definitiva, pero ya la tienes hecha!!!!
Como bien ha comentado algún compañero, la formación presencial de octubre en Madrid queda ya lejos. Sin embargo, vosotros habéis trabajado trimestralmente muy bien sobre lo aprendido allí y eso merece una pequeña reflexión para hacer balance al terminar este primer curso. Por eso tras la aplicación de esta tercera unidad sería muy bueno que reflexionaras brevemente y me contaras:
qué ventajas/inconvenientes le ves a esta metodología activa para el aprendizaje del alumnado
qué dificultades/barreras encuentras tú para aplicarla en Bachillerato.
Un abrazo muy grande desde Pamplona (de vacaciones hasta el lunes
1f601_beamingfacewithsmilingeyes) y ya me contarás.
(1 liked)
[19/04 12:28] Óscar Urmeneta Maestu
Hola Participant 12. Algunos compañeros han planteado la duda de si hay que descontar por los errores en el test individual. Por si acaso te sirve, recuerda que el test individual busca premiar a quien estudia y ser motivante para que estudie para la siguiente vez. Por eso en el test individual se suman los aciertos, pero los errores nunca descuentan. Los errores solo pueden descontar en el test en equipo, pues es mucho más fácil hacer el test en equipo que individualmente.
Un saludo muy cariñoso y mucho ánimo!

[19/04 13:29] Participant 12
Hola Oscar!! Sí, así lo hago, tal y como lo explicaste en la formación o así lo entendí yo. Gracias por el recordatorio!!! Un abrazo!!

[12/06 12:02] Óscar Urmeneta Maestu
Buenos días Participant 12. Espero que todo vaya bien!!!
Recuerda que es muy importante terminar este primer año de formación con un breve balance de lo hecho durante todo el curso desde la formación presencial de octubre en Madrid reflexionando brevemente sobre estos aspectos:
¿qué ventajas/inconvenientes le ves a esta metodología activa para el aprendizaje del alumnado?
¿qué dificultades/barreras encuentras tú para aplicarla en Bachillerato?

Coding Density

'Aprenden un plus'
'Esta metodología está alineada...'
'Me gustaría seguir formándome'
'Les gustó'
'Me da rabia'
'La vorágine del día a día'
'Requiere más tiempo de clase'
'Asumen mucho mejor los contenidos'
'Favorece la motivación'
'Le vamos cogiendo el ritmo'
'Lo que me dicen es que han aprendido'
'El banco es formidable'
'La evaluación entre iguales'
'Me parecen más difíciles...'
'Me ha sido difícil'
'Experimentar personalmente'
'Aire fresco'
'Además de ser operativa...'
'Algunos se descansan en el grupo'
'Algunos alumnos que no asumían'
'Muy positiva y enriquecedora'
'Se implican más'
'Ha cambiado mi perspectiva'
'Sí se puede'
'Temario extenso'
'Gracias por todo'
'Tu seguimiento y ayuda'
'La prueba EVAU'

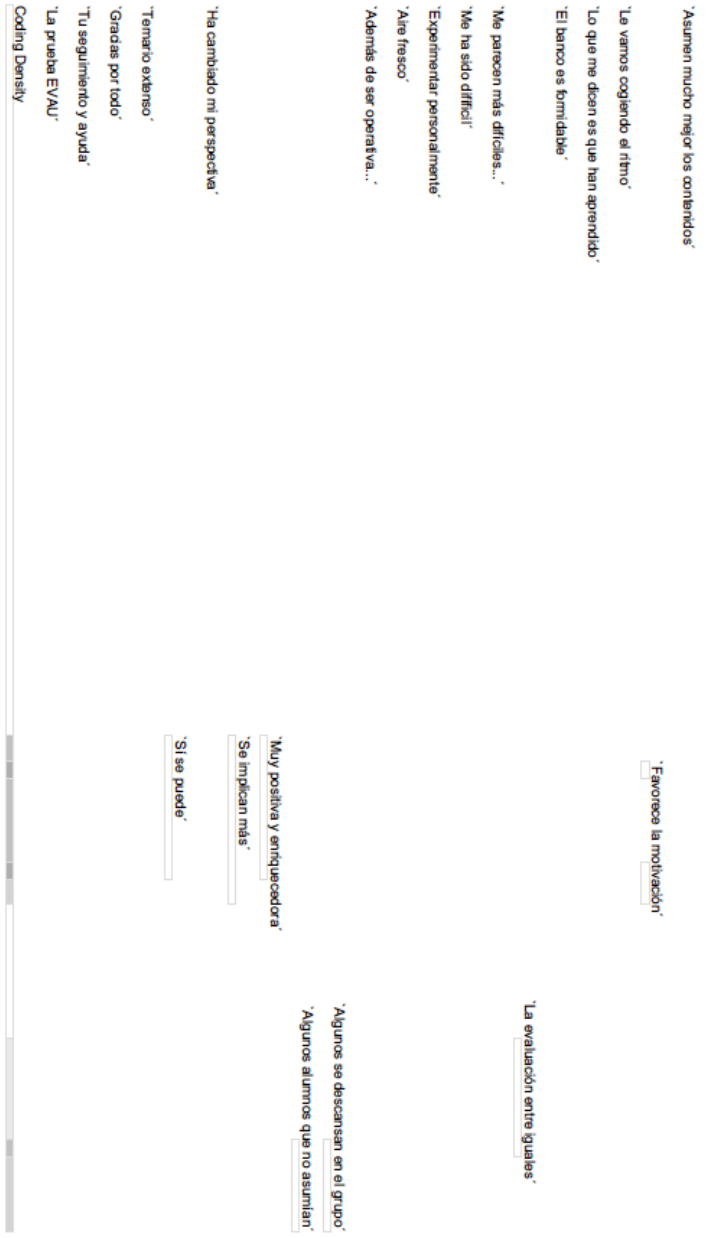
¿Cómo crees que yo te podría ayudar más y mejor?
Un abrazo muy grande!!!!

[Yesterday 09:43] Óscar Urmeneta Maestu
Hola Participant 12. Espero que todo te vaya bien. Perdona que te moleste. Sé que estarás a tope con decisiones de equipo directivo y cerrando el curso, pero sería muy importante que pudieras encontrar unos minutos para cerrar este primer curso de formación en TBL con un pequeño balance. El final de curso está ya muy cerca, y me da miedo que perdamos esta oportunidad.
Por favor, piensa unos minutos en lo hecho durante todo este curso desde la formación presencial de octubre en Madrid y comparte conmigo brevemente lo que piensas:
¿qué ventajas/inconvenientes le ves a esta metodología activa para el aprendizaje del alumnado?
¿qué dificultades/barreras encuentras tú para aplicarla en Bachillerato?
¿Cómo crees que yo te podría ayudar más y mejor?
Un abrazo muy fuerte y mucho ánimo.
Edited

[Yesterday 10:08] Participant 12
Hola Óscar!! Perdona que no lo haya hecho antes, intento sacar esos minutos para poder responder a estas preguntas, que realmente tampoco supone tanto. Pero así es, estamos teniendo un final de curso con muchos frentes abiertos y bastante movido, tanto para cerrar el presente como planificando el siguiente. Entre hoy y mañana lo hago sin falta y disculpa por no haberlo hecho antes.

[Yesterday 10:08] Participant 12
Muchas gracias por todo y sé lo importante que son todos estos comentarios para buscar mejorar todos los procesos, así que cuenta con ellos. Un abrazo muy fuerte!!
[12:39] Participant 12
Hola!! Aquí va la reflexión final:

[13:02] Participant 12
VENTAJAS E INCOVENIENTES: Veo muchos más ventajas que inconvenientes, como vas a ver. En cuanto a las ventajas: se trata de una metodología innovadora, diferente y muy motivadora, no solo para los alumnos, sino también para los profesores (en la preparación de actividades y en aprender junto a los alumnos, ya que tanto la preparación como la realización de las actividades conectadas con situaciones de la vida cotidiana la verdad es que ha hecho que nos enganchemos más a la Física, tanto los alumnos como yo mismo). Los alumnos "buenos" he comprobado que arrastran a los que no lo son tanto, motivándoles a rendir mucho más. Que el profesor cree los grupos y no sean ellos los que se junten por amistades fomenta lo comentado en el anterior punto, si los colocas estratégicamente, para que el que tenga más dificultades pueda ser ayudado y apoyado por el resto y para que el que no trabaje tanto como los demás se de cuenta de esta circunstancia. El poder encajar la unidad cuando más te convenga: yo las he hecho cuando ya terminaban los exámenes de evaluación y a modo de introducción de la siguiente unidad didáctica a impartir, con el objetivo de que la realización de mis unidades TBL afectaran lo menos posible al resto de aprendizajes de los alumnos por acumulación de otras actividades. La evaluación entre iguales que realizan los alumnos creo que es una de las partes más importantes: les hace emitir juicios de valor y calificaciones de sus compañeros de forma razonada y creo que esto les hace madurar en otros aspectos y valores fundamentales, aprendiendo no solo los contenidos, sino a ser justos y objetivos con la valoración del trabajo propio y ajeno. E incovenientes, lo dicho, la verdad es que me he centrado en un único: según la poca experiencia de este curso (quizás con los años y más experiencia en la aplicación vea alguno más): que en algún caso los alumnos no están de acuerdo con los grupos de trabajo conformados ya que en la composición de los mismos se incluya repartidos a los alumnos menos colaborativos, lo cual hace



que sean "etiquetados" de determinadas formas (los "vagos" o los que no me van a ayudar a conseguir mejor nota,...). Quizás esto es lo más difícil de gestionar y por eso me ha constituido un inconveniente, pero es lo que hay, ya que es muy complicado que todos hagan lo mismo dentro de un grupo de trabajo, no solo en bachillerato, sino en ESO y, en general, en la vida....
DIFICULTADES / BARRERAS DE APLICAR EN BACHILLERATO: Pues la principal es que como lo he tenido que aplicar en una asignatura de 2º de bachillerato como es la Física (que además de ser muy exigente tiene un programa muy extenso), he tenido la "presión" del tiempo y que de los propios alumnos demandaban en preparar el examen de la EVAU. Ojalá en el futuro pueda aplicarlo en una de 1º de bachillerato, donde la presión será menor.
CÓMO PUEDES AYUDAR MÁS Y MEJOR: Pues creo que más no puedes hacer y en eso estamos de acuerdo todos. Todas tus explicaciones, implicación, disponibilidad, consejos, orientaciones, correcciones, trato,... es excelente. No puedo decir otra cosa y por lo que hablamos todos los que te conocemos es algo muy común y comentado. Siempre es un gusto oirte y compartir cosas contigo.
Bueno, espero que esta reflexión te sirva y aquí estamos para lo que necesites. Ahora, dentro de poco, toca disfrutar de unas merecidas vacaciones y un reparador descanso para coger fuerzas.
Un abrazo muy muy fuerte y muchas gracias por todo tu trabajo y todo lo que compartes y ayudas a todos!!!!

[19:38] Óscar Urmeneta Maestu
Querido Participant 12, muchísimas gracias por tu fantástica reflexión!!!!! Me alegro infinito que lo veas tan positivamente y creo que aciertas. En cuanto al mayor inconveniente, es cierto que cuando toca un alumno vago que colabora menos, el equipo se puede resentir en el rendimiento y eso puede quemar a sus compañeros. Pero mi experiencia me ha mostrado que también es cierto que, con la evaluación entre iguales, en los equipos con ese perfil es dónde los alumnos que trabajan más se pueden beneficiar en su nota personal: el que un compañero (vago) sea valorado más bajo que el resto implica que lo que no se lleva él se lo lleven los demás. Al final, el trabajo extra que han tenido que hacer les renta en la nota. Pero la clave, como tú muy bien lo has visto, es que la evaluación entre iguales se haga bien. La evaluación entre iguales es capital.
Ahora una buena noticia. La idea es que esto sea una auténtica comunidad de aprendizaje formada por 60 compañeros. Entre todos, ya habéis elaborado unas 150 unidades TBL, 13 de ellas de F/Q. En esta misma comunidad de Teams, en el canal General>archivos (este es el link: General) están archivadas todas las unidades por asignaturas. Puedes mirar si alguna elaborada por otros compañeros te sirve, no para copiarla textualmente (pues la idea es que aprendáis a crear buenas unidades en dos cursos) sino para aprovechar lo que te pueda servir (enfoque, alguna actividad, preguntas de test...). Hay compañeros que lo están haciendo muy bien.
Enhorabuena por tu estupendo trabajo, tu compromiso y tu profesionalidad. Ya sabes que yo estaré aquí para todo lo que quieras y cuando quieras. No cierro en verano mmm, aunque a lo mejor sea más lento respondiendo. Si decides adelantar algo del curso que viene antes o durante las vacaciones, aquí estaré disponible.
Adjunto te envío un certificado que puedes incluir como evidencia de esta formación en tu porfolio.
Cuídate mucho y descansa, te lo mereces valiente!!!!!!!!!!
[Programa de desarrollo profesional FEC-TBL.pdf]

YEAR 2
[13/09/2023 12:56] Óscar Urmeneta Maestu
Hola Participant 12.
Espero que todo haya ido estupendamente durante el verano, que ya parece que queda lejos. Perdona que no me haya puesto en comunicación contigo antes, pero no quería molestarte en el frenético inicio de curso. Simplemente quería hacerme presente y recordarte que estoy aquí para ayudarte en todo lo que



necesites con las 3 unidades que corresponden a este segundo y último año de formación en TBL.
No dudes en consultarme cualquier cosa y en compartir cómo te ha ido también con la aplicación de las unidades que ya pilotaste el curso pasado. Recuerda también que hay unidades creadas por otros compañeros el curso pasado que pueden servirte de inspiración o ayuda para diseñar las de este año.
Un abrazo muy fuerte.
[26/09/2023 12:28] Participant 12
Hola Óscar, ¿Qué tal todo? Espero que también te haya ido todo muy bien. Y sobre el inicio frenético de curso, que nos vamos a contar. No te puedes imaginar (o sí) cómo está siendo, con muchas ausencias y bajas de profesores, dificultades para encontrar sustitutos (es que no hay profesores), LOMLOE y el cuaderno competencial en Educamos (con cuestiones técnicas que no habían caído y que hace que haya dudas),.... En fin, siento no haberte podido contestar antes.
[26/09/2023 12:29] Participant 12
Muchas gracias, como siempre, por tu disponibilidad. En cuanto pueda me pondré a elaborar la unidad TBL para este trimestre. Seguirá siendo para Física de 2º de bachillerato, ya que es la única área que imparto en esta etapa. Sabemos que podremos contar contigo. Bueno, que vaya todo muy bien y un fuerte abrazo!!
[14/10/2023 11:48] Participant 12
Hola Oscar!! Aquí adjunto la unidad TBL de Física de 2º de bachillerato nueva para este curso 2023-2024, para que la revises. Cualquier cosas me dices!! Muchas gracias por todo y un fuerte abrazo!!!!
[14/10/2023 11:48] Participant 12

[14/10/2023 13:28] Óscar Urmeneta Maestu
Hola Participant 12. Muchísimas gracias por tu unidad TBL 4 y especialmente por entregarla en plenas fiestas del Pilar!!!!!!!!!!!!!!!!!Como podrás comprobar, es estupenda. Resultados de aprendizaje potentes, actividades bien alineadas con ellos y muy bien pensadas para hacer significativo el contenido al alumnado. Además, muy bien diseñadas para fomentar discusión y aprender debatiendo sobre ondas. El test parece perfecto (solo tengo una duda en el item 10) y los materiales son adaptados y muy variados con un tiempo de estudio más que razonable. Te hago algunas sugerencias en las actividades, pero ya la tienes hecha!!!!!Si haces algún cambio, vuelve a compartirla para que archive la versión más actualizada, pero ya le has cogido el aire a TBL. Te salen las unidades fenomenales.
Participant 1217/10/2023 17:17
Hola Óscar!!! Ya he añadido y modificado todas tus aportaciones ya que me parecen perfectas. Creo que le dan un toque más significativo a las preguntas, así que he incorporado todas las sugerencias que me has hecho. Te adjunto el archivo de nuevo para que lo clasifiques (lo he llamado igual que el que me has aportado tú + V2, aunque cuando te lo archives guárdatelo como consideres. Muchas gracias de nuevo por tu feedback, ayuda y disposición. Ya te iré contando. La verdad es que esta unidad me gusta bastante como ha quedado ya que creo que les voy a hacer pensar un poco y que van a asimilar bien lo que pretendo. Un abrazo muy fuerte!!!
Movimiento ondulatorio.

Óscar Urmeneta Maestu17/10/2023 17:33
Queda archivada la última versión. Ya me contarás!!!

Óscar Urmeneta Maestu20/12/2023 12:12
Hola Participant 12, ánimo con los pocos días de clase que quedan.... y FELIZ NAVIDAD!!!!

Óscar Urmeneta Maestu8/1 12:59

'Esta metodología está alineada...'
'Me gustaría seguir formándome'
'Les gustó'
'Me da rabia'
'La vorágine del día a día'
'Requiere más tiempo de clase'

'Favorece la motivación'
'Le vamos cogiendo el ritmo'
'Lo que me dicen es que han aprendido'
'El banco es formidable'
'La evaluación entre iguales'
'Me parecen más difíciles...'
'Me ha sido difícil'
'Experimentar personalmente'
'Aire fresco'
'Además de ser operativa...'
'Algunos se descansan en el grupo'
'Algunos alumnos que no asumían'
'Muy positiva y enriquecedora'
'Se implican más'
'Ha cambiado mi perspectiva'
'Si se puede'
'Temario extenso'

'Aprenden un plus'

'Asumen mucho mejor los contenidos'

'Tu seguimiento y ayuda'

'Gracias por todo'

'La prueba EVAU'
Coding Density

FELIZ AÑO
Buenos días Participant 12. Espero que en vacaciones hayas podido disfrutar de un merecidísimo descanso. Ya solo quedan 2 trimestres de esta formación de 2 años. ¡Cómo pasa el tiempo! Ánimo con el trimestre que empieza ahora y ya sabes... estoy a tu entera disposición.
Feliz 2024!!!!!


Participant 128/1 13:10
Hola! Igualmente, Óscar!! Espero que hayas pasado unas buenas y felices vacaciones!!! En breve te adjuntaré la siguiente unidad didáctica de TBL de Física de 2º de bachillerato, para que le eches un vistazo y hagas feedback. Muchas gracias por tus recomendaciones y tu trabajo de asesoría!!!!!
Un abrazo fuerte!!!!

Participant 1210/1 8:24
Hola de nuevo, Óscar!!!
Como te adelanté en el mensaje previo, aquí te adjunto la 5ª unidad TBL para que la revises y me comentes lo que consideres oportuno.
Muchas gracias de nuevo por toda tu disposición y ayuda y espero que hayas tenido un buen comienzo de año!!
Un fuerte abrazo!!!

[10/1 9:33] Óscar Urmeneta Maestu
Buenos días Participant 12. Muchísimas gracias por tu quinta unidad TBL. Ya solo que da una más!!!!!!!! Enhorabuena, está fenomenal. Haces un enrome esfuerzo por contextualizar la teoría en situaciones cercanas al alumnado, y eso seguro que ayuda a que le encuentren má sentido y lo aprendan y recuerden mejor. En varias actividades te hago sugerencias, de poco calado pero que pueden adaptarlas un poco mejor. El test está formalmente perfecto, pero asegúrate de que no es demasiado difícil, porque parece tener muchas preguntas de aplicación.
Si haces algún cambio, vuelve a compartir la unidad para que archive la versión más actualizada, pero ya la tienes hecha. Fenomenal. Van a entendfer perfectamente la teoría de campo eléctrico y van a aprender a aplicarla a la realidad. 
Suerte con ella y ya me contarás!!!!
Participant 1224/1 8:46
Hola Óscar!!

Participant 1224/1 8:51
Muchas gracias por tu feedback. Como siempre, es de mucha utilidad. He hecho algunas modificaciones usando tus consideraciones, así que te vuelvo a enviar la unidad con idichas modificaciones para que puedas archivar la versión definitiva. Muchas gracias de nuevo por todo y que vaya todo muy bien!!! Un fuerte abrazo!!

Óscar Urmeneta Maestu24/1 10:12
Perfecto Félix!!! Guardo esta versión y ya me dirás cómo te ha ido.

Participant 127/4 9:48
6ª UNIDAD TBL
Hola Óscar!! ¿Qué tal todo? Espero que hayáis pasado unas buenas vacaciones de Semana Santa y recuperado fuerzas (tan necesarias) para el tramo final de curso!!!!

Te adjunto aquí la última unidad didáctica TBL del presente curso, para que le eches un vistazo y la revises.

Muchísimas gracias por todo tu trabajo, disponibilidad y aportaciones!!! Ya me dirás lo que te parece en el feedback

Un abrazo muy fuerte y cuidaros mucho!!!!

Óscar Urmeneta Maestu7/4 12:19
Querido Participant 12. Espero que tú también hayas descansado mucho en Semana Santa. ¡Muchísimas gracias por tu 6ª y última unidad TBL de esta formación! Qué rápido pasa el tiempo.

Como no podría ser de otro modo, está fenomenal y solo te hago sugerencias muy menores en las actividades, casi anecdóticas. A ver si te sirven.

En el último feedback que me devuelvas tras aplicar esta última unidad, más que explicar cómo te ha ido con ella, me interesaría que como conclusión de la formación reflexionaras en 5 minutos sobre estas dos preguntas:
¿Qué balance final haces de esta formación de dos años en TBL, qué te ha aportado?
¿Te interesaría seguir creando y aplicando más unidades TBL? Si fuera así, ¿estarías dispuesto a seguir formándote e incluso obtener una certificación oficial en TBL?
Un abrazo muy muy grande, fuerza para lo que queda y enhorabuena por tu trabajo .

[miércoles 10:41] Óscar Urmeneta Maestu
BANCO DE RECURSOS CON 500 UNIDADES TBL QUE PODRÁS APROVECHAR
Querido Participant 12:
La formación TBL de dos cursos está llegando a su fin, y con ella has aprendido a crear e implementar unidades TBL. Ahora tengo el gusto de informarte que en Archivos del canal General de esta comunidad tienes ya a tu disposición un banco de recursos de casi 500 unidades TBL ya creadas y testadas por otros compañeros.
En la carpeta llamada Comunidad_1 (de color verde) tienes 221 unidades TBL creadas por la primera comunidad de aprendizaje que os antecedió. En la carpeta llama Comunidad_2 (de color rojo) tienes casi otras 250 unidades TBL creadas por esta comunidad a la que perteneces. Algunas de ellas son de física, de manera que en cursos posteriores, en lugar de crear unidades desde cero podrás editar, aprovechar o incluso usar las unidades TBL que otros han creado, buscando sinergias entre todos.
A finales de junio incorporaré a los miembros de la Comunidad_1 a esta Comunidad_2, de manera que seréis en total unos 100 profesores de FEC que os podréis ayudar unos a otros, aunque yo seguiré estando aquí para lo que necesitéis.
Con todo esto, y retocando la reflexión que te pedí en el anterior mensaje, en el último feedback que me devuelvas te agradecería que como conclusión de la formación reflexionaras en 5 minutos sobre estas tres preguntas:
¿Qué balance final haces de esta formación de dos años en TBL, qué te ha aportado?
¿Qué te parece el banco de recursos que tienes ahora a tu disposición?
¿Te interesaría seguir creando y aplicando más unidades TBL? Si fuera así, ¿estarías dispuesto a seguir formándote e incluso obtener una certificación oficial en TBL?
Un abrazo enorme y ánimo que ya queda menos.

[8:17] Participant 12
Buenos días, Óscar!! Lo primero disculpas por haber tardado en responder a este mensaje. Como puedes

'Aprenden un plus'
'Esta metodología está alineada...'
'Me gustaría seguir formándome'
'Les gustó'

'Requiere más tiempo de clase'
'Asumen mucho mejor los contenidos'
'Favorece la motivación'
'Le vamos cogiendo el ritmo'
'Lo que me dicen es que han aprendido'
'El banco es formidable'
'La evaluación entre iguales'
'Me parecen más difíciles...'
'Me ha sido difícil'
'Experimentar personalmente'
'Aire fresco'
'Además de ser operativa...'
'Algunos se descansan en el grupo'
'Algunos alumnos que no asumían'
'Muy positiva y enriquecedora'
'Se implican más'
'Ha cambiado mi perspectiva'
'Si se puede'
'Temario extenso'
'Gracias por todo'
'Tu seguimiento y ayuda'
'La prueba EVAU'
Coding Density

'Me da rabia'
'La vorágine del día a día'

imaginarte, vamos a tope con muchos asuntos, y especialmente el mes de mayo va cargadito con muchas cosas.... Voy respondiendo a las preguntas:

[8:22] Participant 12
1) El balance final es muy positivo. Me ha aportado una nueva forma de enfocar determinadas clases, con una metodología innovadora y motivadora tanto para los alumnos como para mi mismo como docente (la preparación de las unidades es motivadora, y supone un reto "imaginativo" que posteriormente lo agradacen los alumnos). Personalmente he tenido un handicap, ya que al tener que elaborar las unidades TBL para la asignatura de Física de 2º de bachillerato, con la extensión del programa y el tiempo tan ajustado que tenemos, me ha resultado en algún momento complicado encajarlo. En concreto, siendo sincero, este curso no he podido aplicar esta última unidad TBL debido a que han ido surgiendo imprevistos en las clases de 2º bachillerato que han hecho que vaya un poco justo en cuanto a la impartición de los contenidos para llegar a EVAU. No obstante, creo que a futuro, si modifican la forma y planteamiento de los exámenes de EVAU siendo más competenciales, los alumnos tendrán un gran entrenamiento con esta metodología para enfrentarse con más seguridad a dichos exámenes.

[8:25] Participant 12
2) Sobre el banco de recursos me parece una excelente idea. De allí podemos sacar unidades para nuestras asignaturas sin partir de cero. La filosofía de colaboración que se propone con este repositorio de todos los colegios FEC es muy positiva y de valorar, ya que aunando esfuerzos crecemos más y permite también optimizar el tiempo de todos, que tan escaso es.

[8:27] Participant 12
3) Si que me interesaría seguir creando más unidades, de hecho en Física de 2º de bachillerato quizás cree alguna más el curso que viene. Y digo quizás, porque lo que me gustaría es poder crear unidades TBL en otra asignatura "con menos presión" que la Física de 2º de bachillerato, pero hoy por hoy es la única que imparto en 2º de bachillerato. Si en el futuro próximo doy otra asignatura, especialmente en 1º de bachillerato (he dado, por ejemplo, muchos años la asignatura de Informática) seguro que preparo unidades TBL, sobre todo en asignaturas más prácticas, como la indicada con anterioridad.

[8:29] Participant 12
Por lo tanto, la disposición a seguir formándome allí está, ya que para poder mejorar en la elaboración de unidades TBL, la formación, la práctica y el reciclaje es fundamental. Si todo esto permiter obtener una certificación, pues perfecto, pero me imagino que será todo a medio-largo plazo.

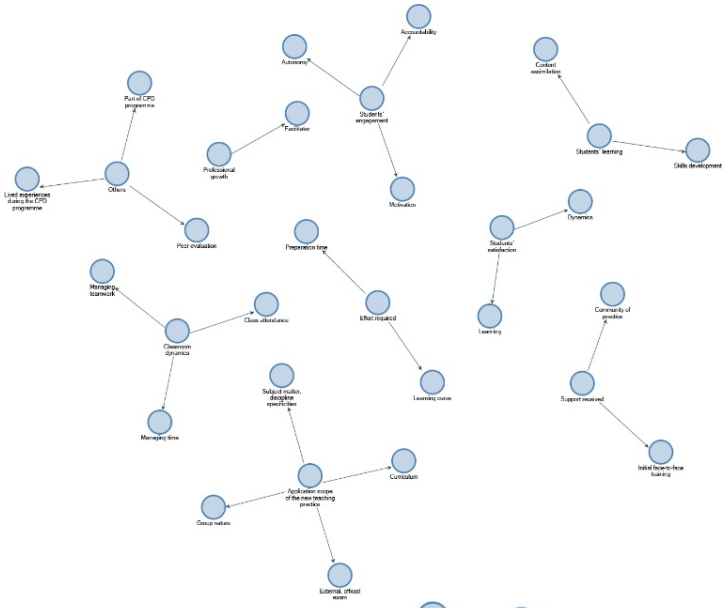
[8:30] Participant 12
Bueno, muchísimas gracias por todo tu apoyo, disposición, colaboración, ayuda,... Creo que hablo en nombre de todos en el este sincero agradecimiento. Ha sido todo un placer compartir esta formación y apoyo online, así como la presencial.

[8:30] Participant 12
Un fuerte abrazo y seguro que nos vemos en actividades conjuntas entre los distintos colegios y si no, aquí estamos online!!!!

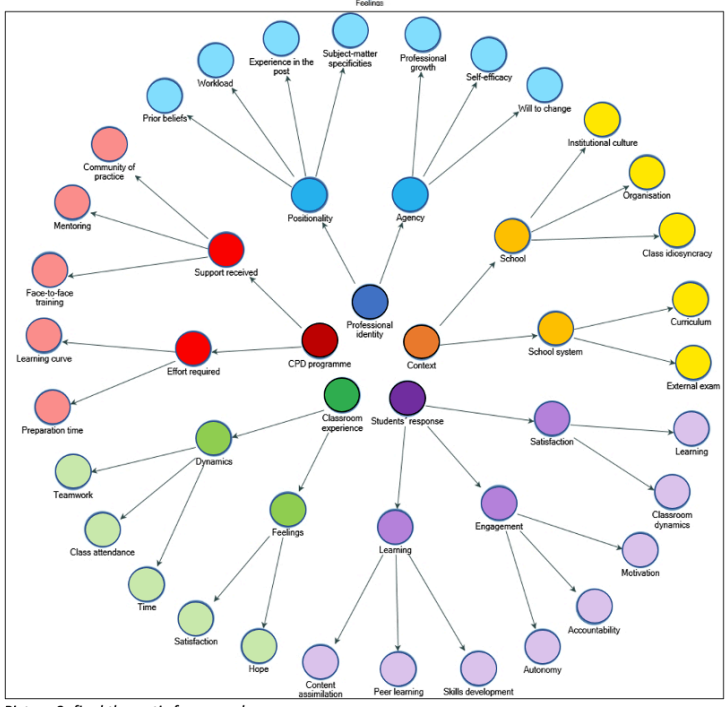
[9:03] Óscar Urmeneta Maestu
Querido Participant 12, muchas gracias por el feedback y por tu profesionalidad. Tomo nota de tu interés y seguiremos en contacto. Feliz fin de curso... y ENHORABUENA!!!!

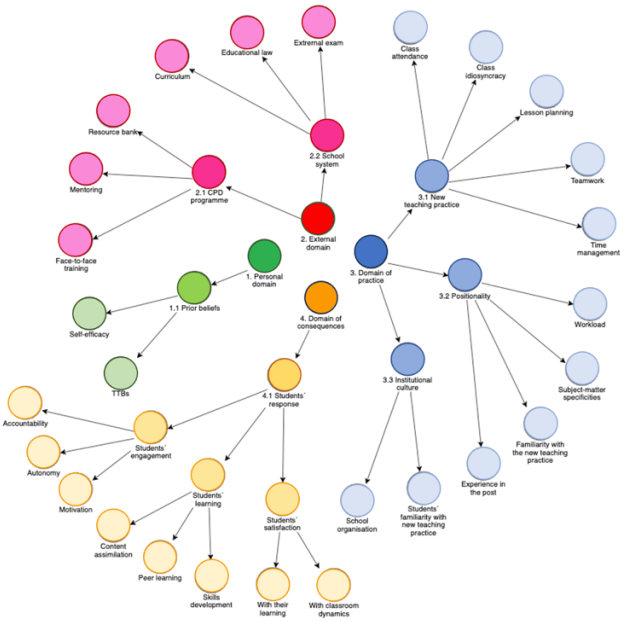


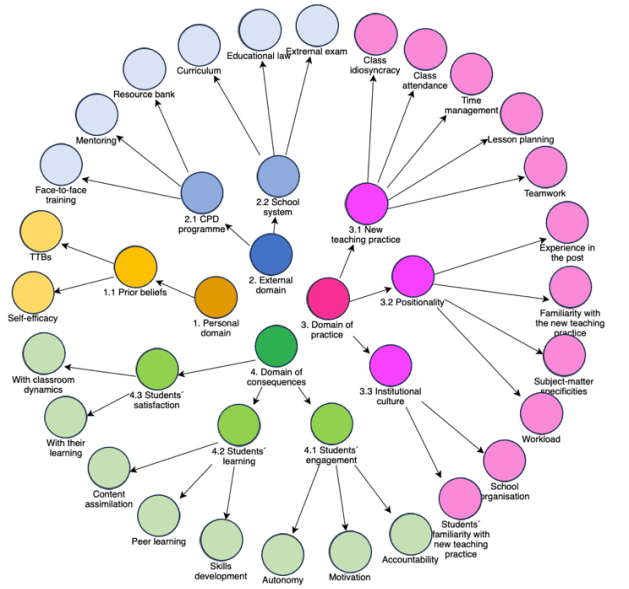
Appendix 11: evolution of the thematic framework after years 1 and 2

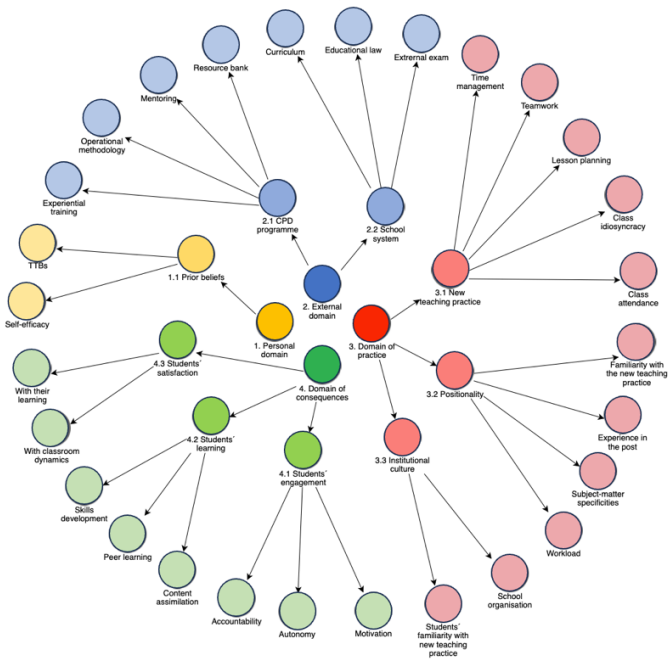







Curriculum
Educational law
Extremal exam
Resource bank
2.2 School system
Mentoring
2.1 CPD programme
Face-to-face training
2. External domain
1. Personal domain
1.1 Prior beliefs
Self-efficacy
TTBs
4. Domain of consequences
4.1 Students' response
Accountability
Students' engagement
Autonomy
Motivation
Students' learning
Content assimilation
Peer learning
Skills development
Students' satisfaction
With their learning
With classroom dynamics
Class attendance
Class idiosyncracy
Lesson planning
Teamwork
3.1 New teaching practice
Time management
3. Domain of practice
3.2 Positionality
Workload
Subject-matter specificities
3.3 Institutional culture
Familiarity with the new teaching practice
Experience in the post
School organisation
Students' familiarity with new teaching practice


Curriculum
Educational law
Extremal exam
Resource bank
Mentoring
Face-to-face training
2.1 CPD programme
2.2 School system
TTBs
1.1 Prior beliefs
Self-efficacy
2. External domain
1. Personal domain
With classroom dynamics
4.3 Students' satisfaction
With their learning
4. Domain of consequences
4.2 Students' learning
4.1 Students' engagement
Content assimilation
Peer learning
Skills development
Autonomy
Motivation
Accountability
Students' familiarity with new teaching practice
School organisation
Workload
Subject-matter specificities
3.3 Institutional culture
Familiarity with the new teaching practice
Experience in the post
3.2 Positionality
3. Domain of practice
3.1 New teaching practice
Time management
Lesson planning
Teamwork
Class attendance
Class idiosyncracy


Curriculum
Educational law
Extremal exam
Resource bank
Mentoring
Operational methodology
Experiential training
2.1 CPD programme
2.2 School system
TTBs
1.1 Prior beliefs
Self-efficacy
2. External domain
1. Personal domain
With their learning
4.3 Students' satisfaction
With classroom dynamics
4. Domain of consequences
4.2 Students' learning
Skills development
Peer learning
Content assimilation
4.1 Students' engagement
Accountability
Autonomy
Motivation
Students' familiarity with new teaching practice
School organisation
Workload
Subject-matter specificities
3.3 Institutional culture
Experience in the post
Familiarity with the new teaching practice
3.2 Positionality
3. Domain of practice
3.1 New teaching practice
Time management
Teamwork
Lesson planning
Class idiosyncracy
Class attendance

Appendix 12: density of codes in the final thematic framework

Name of `verbatim codes´	Description	Sources	References
1. Personal domain	Domain that includes the factors concerning TBs, according to Clark & Hollingsworth´s (2012) interconnected model of professional growth.		
1.1 Prior beliefs	Beliefs held by teachers before the CPD programme		
Self-efficacy	Teachers´ comments on their confidence about their ability to implement the new teaching practice.		
Obstacle			
`Mis dudas iniciales´		16	21
TTBs	Beliefs about teaching before the CPD programme expressed by teachers		
Facilitator			
`Esta metodología está alineada...´	Prior TTBs in line with those underpinning the new teaching practice cannot be changed or not significantly changed, but just reinforced or led to enaction	22	24
Obstacle			
`Creía que el método tradicional era el único...´	Prior TTBs inconsistent with those underpinning the new teaching practice are those to be changed by the CPD programme	32	38
2. External domain	Domain including the factors which are `outside the teacher's personal world´ but may impact on it, according to Clark & Hollingsworth´s (2012) interconnected model of professional growth.		
2.1 CPD programme	Factors concerning the CPD programme seeking a change in TTBs.		
Experiential training	Experiencing the new methodology as students and leaving the face-to-face training with a lesson plan designed was appreciated by participants as an asset facilitating		

Name of `verbatim codes´	Description	Sources	References
	change in their beliefs		
Facilitator			
`Experimentar personalmente´	Having teachers experiencing the new teaching practice as if they were students and creating a lesson plan impacts on their experience of the efficiency of the training received.	9	11
Mentoring	Comments concerning the mentoring process during the 2 academic years.		
Facilitator			
`Tu seguimiento y ayuda´	The importance of the sustained nature of CPD	53	454
Operational methodology	Importance of providing a methodology, a series of steps that allow participants to transfer the training to their practice. Teachers, perceive that the transformative teaching practice proposed is feasible and doable.		
Facilitator			
`Además de ser operativa...´	The importance of providing an operational tool	45	65
Resource bank	Comments referring to the resource bank as part of the CPD programme.		
Facilitator			
`El banco es formidable´	The importance of sharing resources	23	25
2.2 School system	Factors impacting the evolution of TTBs but pertaining to the school system rather than to the school or to teachers´ practice.		
Curriculum	Teachers´ comments on the importance of covering content to comply with the legal curriculum.		

Name of `verbatim codes´	Description	Sources	References
Obstacle			
`Temario extenso´	The pressure of covering content	24	46
Educational law	Comments concerning the new educational law that influence teachers´ response and attitude towards the new teaching practice promoted by the CPD programme.		
Facilitator			
`Aperndizaje estilo LOMLOE´		3	4
Obstacle			
`Nos trae locos con la nueva ley´	The new educational law as an uncomfortable pressure	1	1
Extrernal exam	Teachers´ mentioning the existence of an external exam which at odds with the constructivist approach underpinning the teaching practice piloted.		
Facilitator			
`Se lo toman en serio´	The external exam creates the conditions for students to be engaged	1	1
Obstacle			
`La prueba EVAU´		19	34
2.3 Emotions	Emotions at play when teachers referred to the CPD programme or to the school system.		
Eagerness for implementation			
Facilitator			

Name of `verbatim codes´	Description	Sources	References
`Salgo con ganas´	Teachers´ will to change	9	12
Gratitude			
Facilitator			
`Gracias por todo´	Teachers showing gratitude suggest that they welcome the CPD programme	54	268
Hope			
Facilitator		0	0
`Sí se puede´	Students leave the face-to-face training feeling hope that they will be able to change their teaching practice.	35	49
Professional growth			
Facilitator			
`Ha cambiado mi perspectiva´	The influence of the face-to-face training phase of the CPD programme	37	55
`Me gustaría seguir formándome´	Wish to further development as a sign of the positive influence of the CPD programme in TBs	17	18
Satisfaction			
Facilitator			
`Muy positiva y enriquecedora´	The perception professional growth	30	49

Name of `verbatim codes´	Description	Sources	References
3. Domain of practice	Domain including the factors concerning realm of teachers´ professional actions, according to Clark & Hollingsworth´s (2012) interconnected model of professional growth.		
3.1 Lesson planning	Comments addressing the implications of preparing the new teaching practice.		
Facilitator			
Obstacle			
`El esfuerzo merece la pena´	How more time preparation represents a good investment and pays off	6	9
`Me ha sido difícil´	The difficulty of making a shift in perspective	21	39
`Tiene un trabajo previo importante´	The influence of extra time for preparation	11	15
3.2 New teaching practice	Factors concerning what teachers experienced during the implementation of the new teaching practice, be they in the classroom or in the design of the lesson plans.		
Class attendance	Comments concerning the importance of all students coming to class for the new teaching practice.		
Facilitator			
`Motivar la asistencia a clase´			
Obstacle			
`Absentismo´		11	15
Class idiosyncracy	Comments concerning the nature of the class group as an important factor for the new teaching practice to be effective.		

Name of `verbatim codes´	Description	Sources	References
Facilitator			
`Gracias al grupo´	The influence of the group of students	10	21
Obstacle		1	2
`Con el otro grupo...´	Class group influences teachers´ experience with the innovative teaching practice	12	20
Teamwork	Comments about the teamwork promoted by the new teaching practice.		
Facilitator			
`La evaluación entre iguales´	How peer evaluation was perceived as an advantage of the new teaching practice	19	29
`Una delicia verlos trabajar en equipo´	Advantages found in teamwork. It also includes the following codes from after year 1: - `Ambiente de trabajo enriquecedor´ - `La evaluación entre iguales´	36	68
Obstacle			
`Algunos alumnos que no asumían´	Students' resistance to assume the decisions of their teams	7	11
`Algunos se descansan en el grupo´	Spongers as a problem for teamwork and thus for the new teaching practice	8	10
`La dificultad de generar situaciones de debate real´	The new teaching practice requires teams to engage in between-teams discussions, and this is really difficult	2	2
`La distribución de los grupos´	The difficulty to build appropriate teams	7	9

Name of `verbatim codes´	Description	Sources	References
`La evaluación entre iguales´	Peer evaluation as a challenging issue, as something difficult to achieve and thus an obstacle for teamwork	12	24
`Tener más peso en la nota´	Given the effort taken in classroom time, this lesson plan should count more in the final grades.	3	4
Time management	How time management in the teaching practice piloted influences teachers´ beliefs		
Facilitator			
`Duración adecuada´	No extra time taken to implement the lesson plan	2	4
`Tiempo de clase más destinado a reflexiones´		4	4
Obstacle			
`Requiere más tiempo de clase´		16	29
3.3 Positionality	Factors shaping teachers´ experience which depend on the particular position of the teacher.		
Experience in the post	Comments referring to the role of experience in the post as an important aspect to pilot the new teaching practice.		
Facilitator			
Obstacle			
`Era la primera vez que daba...´	Teachers' experience is also mentioned as an influential factor in teachers´ experience	3	4

Name of `verbatim codes´	Description	Sources	References
Familiarity with the new teaching practice	The role played by becoming familiar with the new teaching practice in the perception of its suitability.		
Facilitator			
`Le vamos cogiendo el ritmo´	Familiarity makes teachers confident with the new practice	11	15
Obstacle			
`Todavía me queda mucho por aprender y mejorar´	Teachers´ satisfaction with the new teaching practice requires practice and experience	13	17
Subject-matter specificities	Comments concerning the subject matter, as if the discipline taught was important for the suitability of the new teaching practice.		
Facilitator			
`Se presta especialmente para...´	Teachers´ experience with the new teaching practice appears to depend on the subject matter.	3	3
Obstacle			
`Me parecen más difíciles...´	The new teaching practice is experienced as more challenging in some disciplines	17	32
Workload	How teachers´ workload is mentioned as an aspect impacting their experience with the new teaching practice and their participation in the CPD programme.		
Facilitator			
Obstacle			
`La vorágine del día a día´	The lack of time	31	52

Name of `verbatim codes´	Description	Sources	References
3.4 Institutional culture	Aspects impacting on teachers experience when piloting the new teaching practice which depend on the school.		
School organisation	How the organisational aspects of a particular school influences teachers´ experience with the new teaching practice.		
Facilitator			
Obstacle			
`Al tener tres clases´	The number of groups may difficult the implementation of the new teaching practice	2	2
`Por imprevistos...´	School organisation can be a problem for innovative practices	17	21
Students´ familiarity with new teaching practice	How teachers perceive that students´ familiarity with the new teaching practice is relevant for it to be effective.		
Facilitator			
`Ya conocían la dinámica´	Participants highlighting that if students are familiar with the constructivist teaching practice, their predisposition to work improves.	26	43
Obstacle			
`Al principio les costó...´	Students struggle with the new teaching practice at the beginning, and this is a challenge for them and for the teacher.	11	20
`Estaban un poco saturados´	The impact of school culture	6	8
3.5 Emotions	Emotions mentioned by teachers when commenting the factors concerning their practice.		
Exhaustion			

Name of `verbatim codes´	Description	Sources	References
Facilitator			
Obstacle			
`Me da rabia´	The lack of time provokes disappointment	20	27
Hope			
Facilitator			
`Se puede utilizar también en´	Teachers hope that the new teaching practice is expandable to other subjects and even school levels	10	12
Obstacle			
`No sé si...´	Teachers doubt about the applicability of the new teaching practice in other subjects	13	15
Satisfaction			
Facilitator			
`Aire fresco´	The emotion felt as a result of the practice was positive and rewarding	46	126
Obstacle			
`No estoy muy contenta´	A bad experience with the constructivist teaching practice could represent an obstacle to the intended change in TBs.	6	9
`Tengo sensaciones contrapuestas´	A mixed experience with the constructivist teaching practice could represent an obstacle to the intended change in TBs.	8	10
4. Domain of consequences	Domain which encompasses the factors concerning the outcomes of teachers´		

Name of `verbatim codes´	Description	Sources	References
	professional action, according to Clark & Hollingsworth´s (2012) interconnected model of professional growth.		
4.1 Students´ engagement	Factors concerning how the evolution of students engagement is perceived as relevant by teachers.		
Accountability	Comments on the importance of students assuming their responsibility of coming prepared to class.		
Facilitator			
`Se implican más´	Some participants highlight that the constructivist approach helps students to account for their work during the lesson, which suggests that accountability may be a factor facilitating the intended change in TBs.	40	94
Obstacle			
`No son muy responsables´	Participants emphasise that students not working satisfactorily is a problem for the constructivist teaching practice.	25	47
Autonomy	Reflections concerning the impact of the ability of students to come prepared to class for the new teaching practice to be effective.		
Facilitator			
`Favorece la autonomía´	Participants highlighting that the constructivist approach fosters students´ autonomy suggests that autonomy may be a factor facilitation their TBs as intended.	12	17
Obstacle			
`Tienen poca autonomía´	The lack of students´ ability to come prepared to class by doing pre-class work is seen by some participants as an issue for the constructivist approach, which suggests that autonomy can be a key factor hampering teachers change their TBs as intended.	17	27
Motivation	Comments concerning how motivation is an outcome of the new teaching practice.		

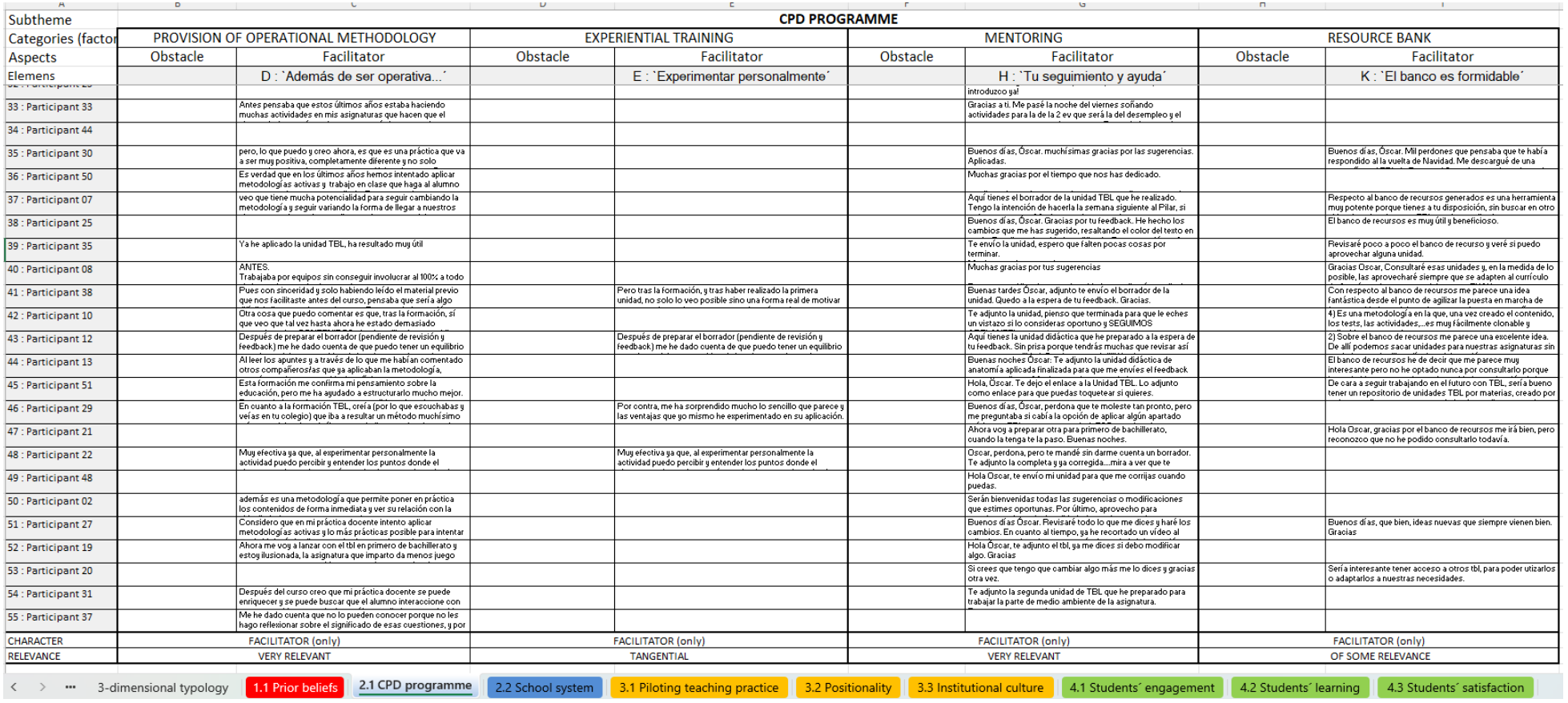
Name of `verbatim codes´	Description	Sources	References
Facilitator			
`Favorece la motivación´	Participants reflections emphasise that one of the positive aspects of the constructivist approach, is the promotion of motivation, which suggests that motivation can be a factor facilitating the intended change in TBs.	36	74
Obstacle			
´La falta de motivación´	Participants´ comments suggest that the constructivist approach does not work without student motivation, which suggests that the lack of students´ motivation can hamper the intended change in TBs.	14	18
4.2 Students´ learning	Aspects mentioned by teachers as important and concerning students´ learning.		
Content assimilation	Comments referring to the assimilation of content when evaluating the suitability of the new teaching practice.		
Facilitator			
`Asumen mucho mejor los contenidos´	Participants commenting that students´ assimilation of theoretical content with the constructivist teaching practice is deeper and more long-lasting than using their traditional approach may be a sign that the assimilation of conceptual content is a factor facilitating the intended change in TBs.	42	80
Obstacle			
`No se profundiza´	Participants comments suggesting that the constructivist teaching practice impacts negatively on students´ assimilation of content may suggests that conceptual content is a factor hampering the intended change in TBs.	5	10
Peer learning	Comments addressing the importance of learning from others in the new teaching practice.		
Facilitator			

Name of `verbatim codes´	Description	Sources	References
`Aprenden unos de otros´	Participants point out that the constructivist teaching practice lead students to learno from one another.	7	9
Obstacle			
Skills development	Comments pointing to the relevance of skills development in the new teaching practice.		
Facilitator			
`Aprenden un plus´	Comments suggesting that the constructivist teaching practice is superior to their traditional practice in terms of skills development.	31	80
Obstacle			
`Y no pueden mejorar...´	Participants´ reflections suggesting that the constructivist approach is inferior to their traditional practice in terms of skills development	2	2
4.3 Students´ satisfaction	Factors mentioned by teachers which refer to how far students liked or didn't like the new teaching practice.		
With classroom dynamics	Comments showing teachers´ perception of the importance of how students experience and evaluate the classroom dynamics of the new teaching practice.		
Facilitator			
`Les gustó´	Participants´ perception that students do like and enjoy the new practice may lead them to change their TBs.	43	105
Obstacle		1	1
`No les gusta´	If students dislike the new teaching practice, teachers may resist to change their TBs.	9	13
With their learning	Comments highlighting students' satisfaction with the learning gained with the new teaching practice.		

Name of `verbatim codes´	Description	Sources	References
Facilitator			
`Lo que me dicen es que han aprendido´	Students´ perception of their learning with the new teaching strategy.	9	9
Obstacle			
`Creen que no sacan resultados igual´	Some teachers point out that students consider that they learn less with the constructivist approach.	5	6
4.4 Emotions	Emotions expressed by teachers when commenting students´ response to the new teaching practice.		
Because of students´ engagement			
Facilitator			
`Discusiones muy enriquecedoras´	Students´ engagement as the source of teachers´ satisfaction	7	8
Obstacle			
Because of students´ learning			
Facilitator			
`Profundizamos más en la materia´	Teachers´ satisfaction derives mainly from students learning as the main outcome	4	5
Obstacle			

Name of `verbatim codes´	Description	Sources	References
Because of students´ satisfaction			
Facilitator			
`Les gustó, me gustó, aprendieron´	Students liking the new teaching practice is the reason for teachers´ satisfaction.	23	28
Obstacle			
`No termina de valorarlo bien´	Students´ resistance as a factor impacting on teachers' attitude towards the new teaching practice.	4	5
Just type of experience			
Facilitator			
`Una experiencia positiva´	A positive experience without specifying whether the reason is students´ learning, satisfaction, or both.	6	6
Obstacle			
`Los chicos se agobian´	Students´ resistance as a source of teachers' attitude towards the change in teaching practice	2	4

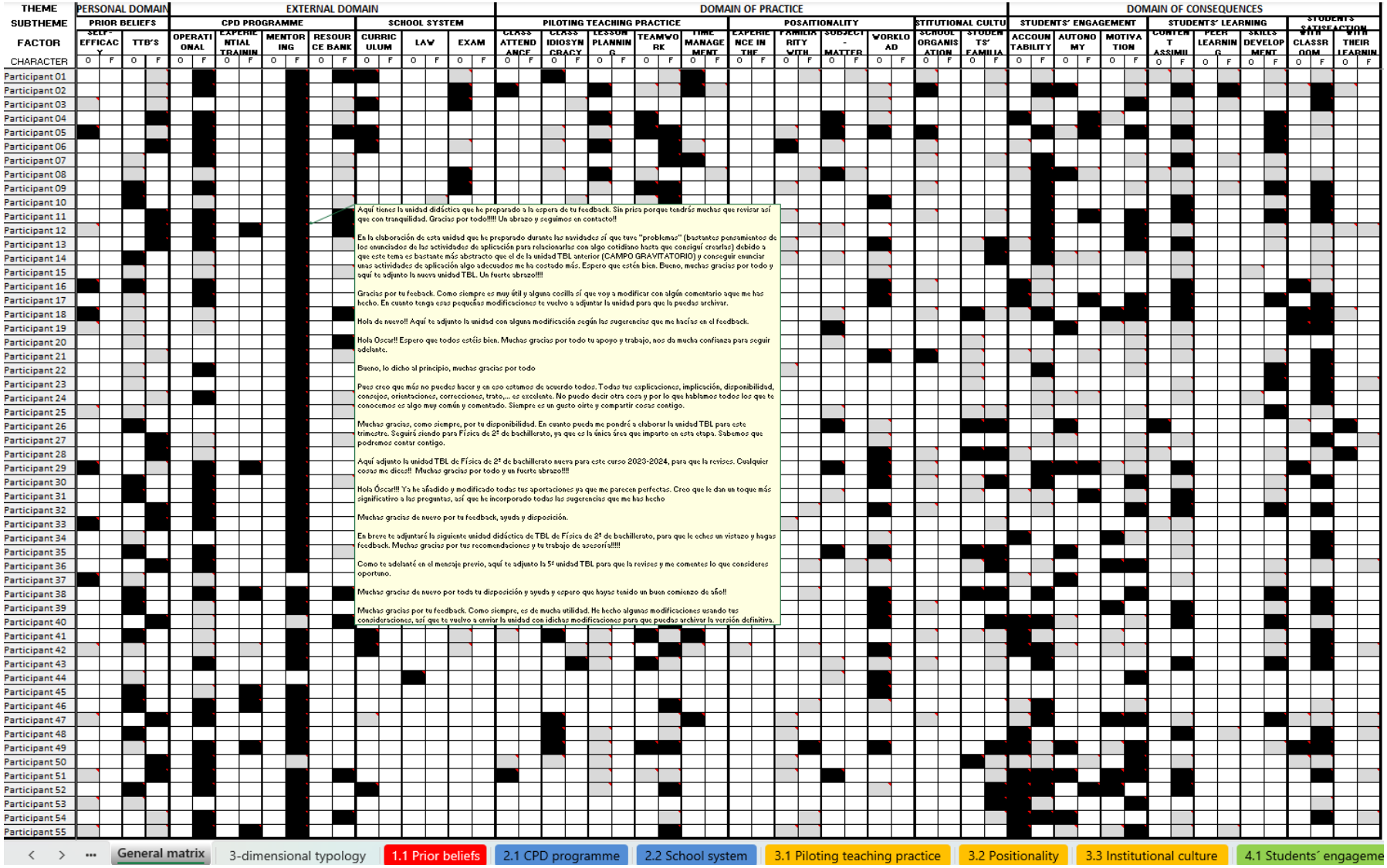
Appendix 13: screenshot of one of the framework matrices



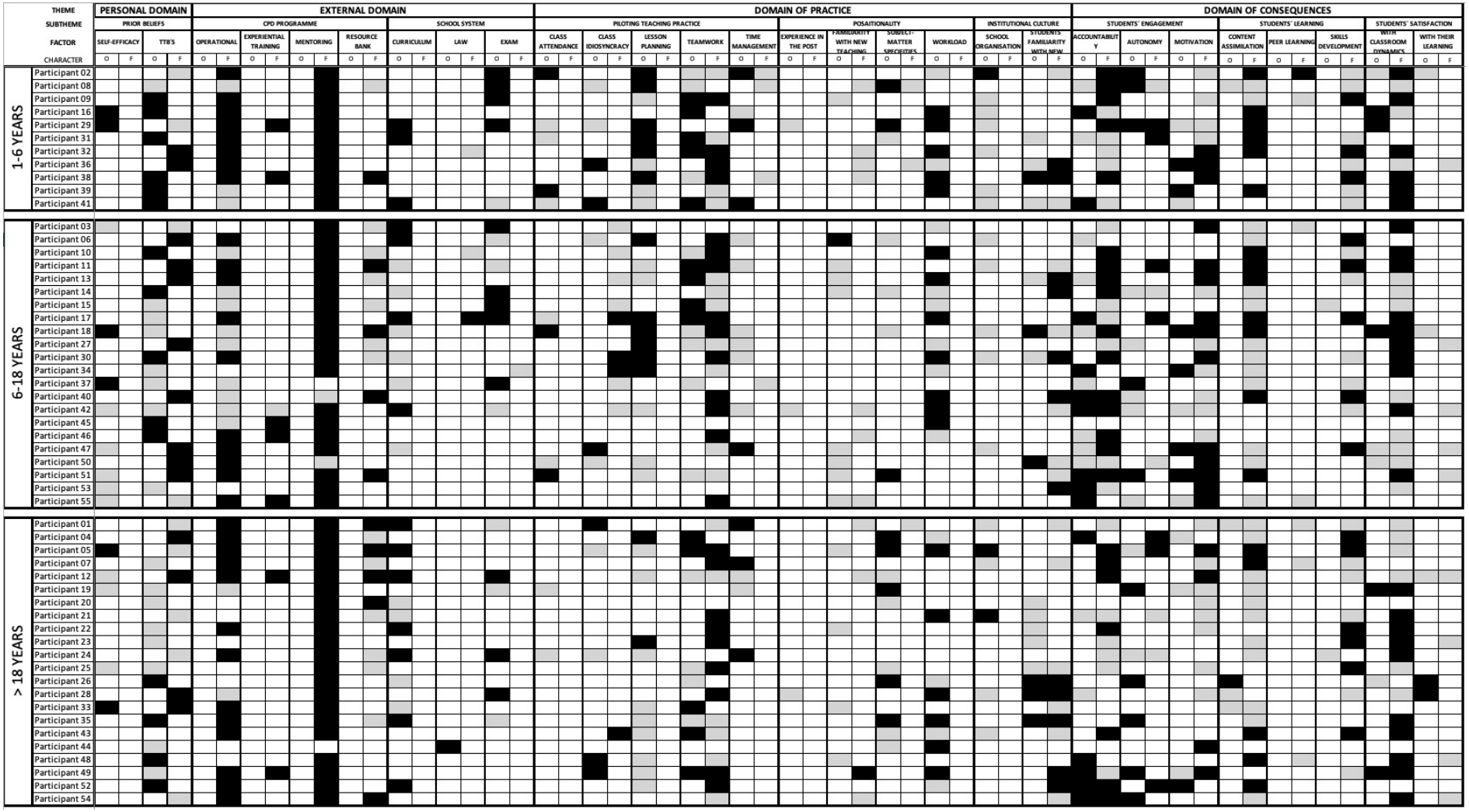
Subtheme	CPD PROGRAMME							
Categories (factor	PROVISION OF OPERATIONAL METHODOLOGY		EXPERIENTIAL TRAINING		MENTORING		RESOURCE BANK	
Aspects	Obstacle	Facilitator	Obstacle	Facilitator	Obstacle	Facilitator	Obstacle	Facilitator
Elemens		D : `Además de ser operativa...´		E : `Experimentar personalmente´		H : `Tu seguimiento y ayuda´		K : `El banco es formidable´
						introduzoo ya!		
33 : Participant 33		Antes pensaba que estos últimos años estaba haciendo muchas actividades en mis asignaturas que hacen que el				Gracias a ti. Me pasé la noche del viernes soñando actividades para la de la 2 ev que será la del desempleo y el		
34 : Participant 44								
35 : Participant 30		pero, lo que puedo y creo ahora, es que es una práctica que va a ser muy positiva, completamente diferente y no solo				Buenos días, Óscar. muchísimas gracias por las sugerencias. Aplicadas.		Buenos días, Óscar. Mil perdones que pensaba que te había respondido al la vuelta de Navidad. Me descargué de una
36 : Participant 50		Es verdad que en los últimos años hemos intentado aplicar metodologías activas y trabajo en clase que haga al alumno				Muchas gracias por el tiempo que nos has dedicado.		
37 : Participant 07		veo que tiene mucha potencialidad para seguir cambiando la metodología y seguir variando la forma de llegar a nuestros				Aquí tienes el borrador de la unidad TBL que he realizado. Tengo la intención de hacerla la semana siguiente al Pilar, si		Respecto al banco de recursos generados es una herramienta muy potente porque tienes a tu disposición, sin buscar en otro
38 : Participant 25						Buenos días, Óscar. Gracias por tu feedback. He hecho los cambios que me has sugerido, resaltando el color del texto en		El banco de recursos es muy útil y beneficioso.
39 : Participant 35		Ya he aplicado la unidad TBL, ha resultado muy útil				Te envío la unidad, espero que falten pocas cosas por terminar.		Revisaré poco a poco el banco de recurso y veré si puedo aprovechar alguna unidad.
40 : Participant 08		ANTES. Trabajaba por equipos sin conseguir involucrar al 100% a todo				Muchas gracias por tus sugerencias		Gracias Oscar, Consultaré esas unidades y, en la medida de lo posible, las aprovecharé siempre que se adapten al currículo
41 : Participant 38		Pues con sinceridad y solo habiendo leído el material previo que nos facilitaste antes del curso, pensaba que sería algo		Pero tras la formación, y tras haber realizado la primera unidad, no solo lo veo posible sino una forma real de motivar		Buenas tardes Óscar, adjunto te envío el borrador de la unidad. Quedo a la espera de tu feedback. Gracias.		Con respecto al banco de recursos me parece una idea fantástica desde el punto de agilizar la puesta en marcha de
42 : Participant 10		Otra cosa que puedo comentar es que, tras la formación, sí que veo que tal vez hasta ahora he estado demasiado				Te adjunto la unidad, pienso que terminada para que le eches un vistazo si lo consideras oportuno y SEGUIMOS		4) Es una metodología en la que, una vez creado el contenido, los tests, las actividades,...es muy fácilmente clonable y
43 : Participant 12		Después de preparar el borrador (pendiente de revisión y feedback) me he dado cuenta de que puedo tener un equilibrio		Después de preparar el borrador (pendiente de revisión y feedback) me he dado cuenta de que puedo tener un equilibrio		Aquí tienes la unidad didáctica que he preparado a la espera de tu feedback. Sin prisa porque tendrás muchas que revisar así		2) Sobre el banco de recursos me parece una excelente idea. De allí podemos sacar unidades para nuestras asignaturas sin
44 : Participant 13		Al leer los apuntes y a través de lo que me habían comentado otros compañeros/as que ya aplicaban la metodología,				Buenas noches Óscar: Te adjunto la unidad didáctica de anatomía aplicada finalizada para que me envíes el feedback		El banco de recursos he de decir que me parece muy interesante pero no he optado nunca por consultarlo porque
45 : Participant 51		Esta formación me confirma mi pensamiento sobre la educación, pero me ha ayudado a estructurarlo mucho mejor.				Hola, Óscar. Te dejo el enlace a la Unidad TBL. Lo adjunto como enlace para que puedas toquetear si quieres.		De cara a seguir trabajando en el futuro con TBL, sería bueno tener un repositorio de unidades TBL por materias, creado por
46 : Participant 29		En cuanto a la formación TBL, oreía (por lo que escuchabas y veías en tu colegio) que iba a resultar un método muchísimo		Por contra, me ha sorprendido mucho lo sencillo que parece y las ventajas que yo mismo he experimentado en su aplicación.		Buenos días, Óscar, perdona que te moleste tan pronto, pero me preguntaba si cabía la opción de aplicar algún apartado		
47 : Participant 21						Ahora voy a preparar otra para primero de bachillerato, cuando la tenga te la paso. Buenas noches.		Hola Oscar, gracias por el banco de recursos me irá bien, pero reconozco que no he podido consultarlo todavía.
48 : Participant 22		Muy efectiva ya que, al experimentar personalmente la actividad puedo percibir y entender los puntos donde el		Muy efectiva ya que, al experimentar personalmente la actividad puedo percibir y entender los puntos donde el		Oscar, perdona, pero te mandé sin darme cuenta un borrador. Te adjunto la completa y ya corregida....mira a ver que te		
49 : Participant 48						Hola Oscar, te envío mi unidad para que me corrijas cuando puedas.		
50 : Participant 02		además es una metodología que permite poner en práctica los contenidos de forma inmediata y ver su relación con la				Serán bienvenidas todas las sugerencias o modificaciones que estimes oportunas. Por último, aprovecho para		
51 : Participant 27		Considero que en mi práctica docente intento aplicar metodologías activas y lo más prácticas posible para intentar				Buenos días Óscar. Revisaré todo lo que me dices y haré los cambios. En cuanto al tiempo, ya he recortado un vídeo al		Buenos días, que bien, ideas nuevas que siempre vienen bien. Gracias
52 : Participant 19		Ahora me voy a lanzar con el tbl en primero de bachillerato y estoy ilusionada, la asignatura que imparto da menos juego				Hola Óscar, te adjunto el tbl, ya me dices si debo modificar algo. Gracias		
53 : Participant 20						Si crees que tengo que cambiar algo más me lo dices y gracias otra vez.		Sería interesante tener acceso a otros tbl, para poder utizarlos o adaptarlos a nuestras necesidades.
54 : Participant 31		Después del curso creo que mi práctica docente se puede enriquecer y se puede buscar que el alumno interaccione con				Te adjunto la segunda unidad de TBL que he preparado para trabajar la parte de medio ambiente de la asignatura.		
55 : Participant 37		Me he dado cuenta que no lo pueden conocer porque no les hago reflexionar sobre el significado de esas cuestiones, y por						
CHARACTER	FACILITATOR (only)		FACILITATOR (only)		FACILITATOR (only)		FACILITATOR (only)	
RELEVANCE	VERY RELEVANT		TANGENTIAL		VERY RELEVANT		OF SOME RELEVANCE	

3-dimensional typology | 1.1 Prior beliefs | 2.1 CPD programme | 2.2 School system | 3.1 Piloting teaching practice | 3.2 Positionality | 3.3 Institutional culture | 4.1 Students´ engagement | 4.2 Students´ learning | 4.3 Students´ satisfaction

Appendix 14: screenshot of the general matrix while the mouse is hovering over one cell



Appendix 15: example of general matrix structured according to years of teaching experience



Appendix 16: CUREC Form 1A

Central University Research Ethics Committee (CUREC)

CUREC 1A Form for Application for research projects in the social sciences and humanities with less complex ethical issues

The University of Oxford places a high value on the knowledge, expertise, and integrity of its members and their ability to conduct research to high standards of scholarship and ethics. The research ethics review process has been established to ensure that research involving human participants is conducted in a way that respects the dignity, rights, and welfare of participants, and minimises risk to participants, researchers, third parties, and to the University itself. It is assumed that all members of the University will take their responsibilities and obligations seriously and will ensure that their research involving human participants is conducted according to established principles and good practice in their field and in accordance, where appropriate, with legal requirements.

Before completing this form, please refer to the guidance and flowchart on the Research Support website. Only type-written forms will be accepted. Completed application forms should be emailed, along with relevant supporting documents, to your Departmental Research Ethics Committee (DREC) or to ethics@socsci.ox.ac.uk from your ox.ac.uk email address.

Please contact your DREC or the SSH IDREC if you have any questions about completing this form or the review process.

SECTION A: Filter for CUREC 2 application		
This section determines whether the application for ethics review should be made using this form (CUREC 1A) or the CUREC 2 form (for research with more complex ethical issues).		
Please indicate with an 'X'.	**Yes**	**No**
1. Does the research involve the deception of participants?	☐	☒
2. Are the research participants vulnerable in the context of the research, or classed as people whose ability to give free and informed consent is in question? For example, • Participants aged 16 or under (also answer question A5); • Participants aged 16 – 18 (refer to competent youths for guidance); • adults at risk; Note the University's Safeguarding Guidance and Code of Practice and its implications for researchers involving young people or adults at risk.	☐	☒
3. By taking part in the research, will participants be at risk of criminal prosecution or significant harm?	☐	☒
4. Does your research raise issues relevant to the Counter-Terrorism and Security Act (the Prevent Duty), which seeks to prevent people from being drawn into terrorism? Best Practice Guidance 07 on the Prevent Duty provides further guidance.	☐	☒
If you answered **'No'** to all the questions above, go to Section B. If you answered **'Yes'** to any question above, continue to question 5 below.		
5. Is your project covered by a CUREC Approved Procedure?	☐	☐
If yes, list the CUREC Approved Procedure(s) you will follow		

If you have answered '**No**' to all questions 1-4, go on to **Section B**. If you answered '**Yes**' to ANY of questions 1-4, and answered '**No**' to question 5, **stop** completing this form and do not submit it for ethical review. You will instead need to submit a CUREC 2 application form. If you answered '**Yes**' to **any** of questions 1-4, and your project is covered by an Approved Procedure, **go on to Section B**. If more than one Approved Procedure applies, contact the SSH IDREC or your DREC for advice on whether a CUREC 2 form should be submitted instead.		
SECTION B: Researchers		
1. Name of Principal Investigator or student's supervisor	Nigel Fancourt	
2. Department or Institute	Department of Education	
3. University of Oxford email address	nigel.fancourt@education.ox.ac.uk	
Copy and paste the following six rows as necessary to complete for each additional researcher who will be involved in this study, including student(s) and those external to the University.		
4. Name of researcher or student	Oscar Urmeneta	
5. Department or Institute	Department of Education	
6. University of Oxford email address	oscar.urmeneta@education.ox.ac.uk	
7. Role in research	Student	
8. Degree programme, if student research	DPhil (part time)	
The whole research team		
9. Have the researchers undertaken research ethics and integrity training?	**Yes** ☒	**No** ☐
10. Please provide details of any research ethics and integrity training undertaken, including the dates of the training. Alternatively state relevant research experience.	a) Research integrity – core course (9/1/2022) b) Supplementary modules: - Conflicts of interest (5/3/2022) - Research involving human participants (6/3/2022)	
11. State any conflicts of interest and explain how these will be addressed.		
There is neither a financial nor a non-financial conflict of interest. The study raises some issues of positionality, discussed in section G.5, as I am researching my own institution.		

SECTION C: The research project	
1. Title of the research project	
The development of teachers' teaching beliefs in response to continuous professional development: an intervention study.	
2. Anticipated start date of the aspect of the research project involving human participants and/ or personal data.	1/6/22
3. Anticipated research end date.	30/6/27
4. Provide a brief lay summary of the aims and objectives of the research. This should cover the questions it will answer and any potential benefits. (max 300 words)	

Teacher educators and school leaders strongly committed to transforming teaching practices rely on the power of continuous professional development to help teachers grow and develop their teaching beliefs. However, the issue whether and how teachers' beliefs develop over time is under-researched, and the development of experienced teachers' teaching beliefs in particular remains virtually unexplored.

As a teacher educator and the leader of the training strategy of my school federation, I aim to understand how post-secondary teachers' teaching beliefs develop in response to long-term, continuous professional development by exploring to what extent and how the teaching belief profiles of a group of 60 teachers from 11 schools across Spain change during their participation in an institutional 2-year blended programme.

Given the elusive and highly situated nature of teachers' beliefs, I will adopt an ecological approach, addressing the following two research questions from three different perspectives (what teachers explicitly report on their own beliefs, their lived experiences, and their performance during the programme):

a) To what degree do teachers' teaching belief profiles change in response to the 2-year continuous professional development programme, if at all?
b) How does teachers' personal and contextual factors (e.g., years of teaching experience, school subject, school leadership…) influence this change in teachers' teaching belief profiles, or the lack of it?

Seeking for consistency and complementarity between the answers to these two questions from the above-mentioned perspectives will allow me to better infer the evolution of teachers' teaching beliefs and understand how best to help them grow professionally and adapt their teaching practices.

5. Please indicate the methods to be used (indicate with an '**X**'):	
Analysis of existing records	☐
Snowball sampling (recruiting through contacts of existing participants)	☐
Use of casual or local workers e.g. interpreters (refer to guidance in BPG 01: Researcher safety)	☐
Participant observation	☐
Covert observation	☐
Observation of specific organisational practices	☐
Participant completes questionnaire in hard copy	☐
Participant completes online questionnaire or other online task (refer to guidance in BPG 06: Internet-mediated research)	☒
Using social media to recruit or interact with participants (refer to guidance in BPG 06: Internet-mediated research)	☐
Participant performs paper and pencil task	☐
Participant performs verbal or aural task (e.g. for linguistic study)	☐
Focus group	☐
Interview (refer to guidance in BPG 10: Conducting research interviews)	☐
Audio recording of participant (you will generally need specific consent from participants for this)	☐

Video recording of participant (you will generally need specific consent from participants for this)	☐
Photography of participant (you will generally need specific consent from participants for this)	☐
Others (please specify below) Participant interacts/reflects within the institutional online community of practice Participant shares lesson plans within the institutional online community of practice	☒

6. Provide a brief summary of the research design and methods. What will research participants be asked to do? (max 300 words)
   Please also submit a copy of the questions participants will be asked, if applicable, or some information about the sorts of topics that will be covered.

This research is a single, longitudinal case study in the form of a panel study, tracking exactly the same 60 teachers across their participation in a 2-year continuous professional development programme. It adopts a mixed-method approach with a convergent, parallel design, collecting quantitative and qualitative data from three different perspectives separately and putting them together for

As a practitioner researcher, I will make the most of the information naturally gathered during the programme, minimising the collection of data that respond exclusively to my needs as a researcher.

In this sense, the data dealing with the perspectives on teachers' lived experiences and their performance will be naturally gathered as integral part of the school intervention through online portfolios; ones that are conformed by teachers' interaction with me as the teacher educator or with other participants across 2 academic years within the online community of practice hosted in the institutional Microsoft Teams. These interactions (appendix 1) will include both reflections on their experience and artifacts in the form of lesson plans (appendix 2). The collection of qualitative data will take place throughout the whole school intervention a far as teachers progress in their participation in the programme.

However, gathering teachers' explicit opinion about their own teaching beliefs is not an integral part of the school intervention, and the data collection should be non-intrusive and comfortable for participants, with no implications for their educational experience. Accordingly, I will ask all post-secondary teachers at the school federation (not only participants in the programme) to voluntarily and anonymously complete a short, online, closed-ended questionnaire (appendix 3) (rather than to participate in online interviews), using the Microsoft Forms application that is included in the Nexus365 account provided by the University of Oxford. I will ask teachers to submit the questionnaire three times (just before the school intervention, after year 1, and after year 2).

7. List the location(s) where the research will be conducted, including any other countries.	Spain: Pamplona, Lugo, Zaragoza, Huesca, Madrid, Badajoz, Algeciras, Chipiona, Cuenca, Castellón
8. Clarify which parts of the research will be conducted in-person and which will take place remotely, e.g. online.	Although the school intervention is blended and includes initial in person training, all the data are collected in digital format and all the research takes places remotely.

	Yes	☐
	No	☐

9. If your research involves fieldwork or travel and your department requires a travel risk assessment, will you have completed and returned a risk assessment form beforehand? Please indicate with an '**X**'. (This must be approved by your department before you travel. If you are travelling overseas, you are advised to take out University travel insurance.) Refer to guidance available from your Department, the Safety Office, the Social Sciences Division, and the Humanities Division, and on travel for University business.	Not required in this instance	☒

10. In the case of international or collaborative research, explain how you will address any ethical issues specific to the local context. Please provide details of the local review, approval or permission obtained or required. Refer to the BPG 16: Social science research conducted outside the UK. If there will be no local review, explain why not. Please mention any stakeholder or community engagement that has been/ will be undertaken in relation to the research. Please also address any physical or psychological risks for Oxford researchers and local fieldworkers in Section G.
While the study addresses a continuous professional development programme in Spain, the Federation´s Steering Committee officially approved the research without requiring additional ethical review other than the CUREC approval. It is straightforward and very unlikely to cause any harm. The data are not sensitive and will be naturally collected as integral part of the programme (except a very short, simple questionnaire) with no interviews. The research is in the interest of the school federation (Fundación Educación Católica, FEC) and was officially approved and encouraged by its Steering Committee in September 2021.

11. Name of departmental/ peer reviewer (if applicable)	Not applicable
12. External organisation funding the research and grant reference (if applicable)	Not applicable
13. Please refer to the CUREC Best Practice Guidance and list any that have been used to develop your research.	BPG 06 Internet-mediated research BPG 09 Data collection, protection and management BPG 16 Social science research conducted outside the UK

SECTION D: Recruitment of research participants
1. Number of participants
- About 200 teachers in the quantitative strand (questionnaire) - About 60 teachers in the qualitative strand (teachers´ reflections and performance)
2. How was the number of participants decided?
In the questionnaire, participation is non-intrusive and will take teachers 5 minutes. As my intention is to have a roughly comparable control group, I expect that the great majority of the federation´s post-obligatory, secondary teachers (about 215) agree to participate. The number of participants in the qualitative strand seeks to enable that the findings are as representative and accurate as possible. As participation does not require that participants do any additional task, I expect that all participants in the professional development programme agree to participate in the research.
3. Age range of participants
18 and over

<table>
<tr><td colspan="3">4. Inclusion criteria</td></tr>
<tr><td colspan="3">Questionnaire: all the post-secondary teachers at the school federation who are willing to participate.
Qualitative strand: all the teachers participating in the professional development programme who are willing to participate.</td></tr>
<tr><td>5. Exclusion criteria</td><td colspan="2">None</td></tr>
<tr><td rowspan="10">6. Indicate with an 'X' all intended recruitment methods
Please submit copies of the recruitment material that will be used, e.g. advertisement text, introductory email text.</td><td>Poster advert</td><td>☐</td></tr>
<tr><td>Flyer</td><td>☐</td></tr>
<tr><td>Email circulation</td><td>☒</td></tr>
<tr><td>Social media (e.g. Twitter, Facebook)</td><td>☐</td></tr>
<tr><td>Website</td><td>☐</td></tr>
<tr><td>In-person approach</td><td>☒</td></tr>
<tr><td>Snowball sampling</td><td>☐</td></tr>
<tr><td>Recruitment sites (e.g. Mechanical Turk)</td><td>☐</td></tr>
<tr><td>Existing contacts or volunteer database</td><td>☒</td></tr>
<tr><td>Other (please specify):</td><td>☐</td></tr>
<tr><td colspan="3">7. How will potential participants be identified and approached?</td></tr>
<tr><td colspan="3">Questionnaire: potential participants have been identified using the current teaching staff list of the school federation and will be approached directly by myself. Using my Oxford University account, I will send them an email with the link to the questionnaire (appendix 4) and an information sheet attached (appendix 5).

Qualitative strand: potential participants have already been identified by the headteachers, who have selected the teachers taking part in the professional development programme. They will be approached in person by myself. As the teacher educator and the researcher, I will inform them at the end of the initial face-to-face training of the programme by projecting and explaining the information sheet (appendix 6) that I will send them later using the email list provided by the organisation (appendix 7).</td></tr>
<tr><td>8. Will informed consent be obtained from the research participants or their parents/ guardians? If not, please explain why not.</td><td colspan="2">Yes</td></tr>
<tr><td>9. For each activity or group of participants, explain how informed consent will be obtained from the participants themselves and/ or their parents/ guardians, if applicable. How will their consent be recorded?

Please submit copies of all participant-facing materials for review. E.g.:
• Recruitment material (e.g. emails, posters)
• Information for participants to read (or hear) before they agree to take part (e.g. written information or, if applicable, an outline oral information script).</td><td colspan="2">Informed consent will be obtained from the participants themselves.

Questionnaire: to simplify the process, I will inform about the study, obtain the informed consent, and collect the data at the same time. The questionnaire will be completed anonymously using the Microsoft Forms application included in my Oxford University Office 365 account. The questionnaire will have two sections. The first section will have only one question asking participants for their informed consent (appendix 8). If participants agree to participate, they will continue to the second section with the 17</td></tr>
</table>

• A document to record informed consent. Further guidance and templates.	questions. If they do not agree, the questionnaire will finish. I will follow this process in all three data collection timepoints: baseline (before the intervention), time 1 (during the intervention), and time 2 (after the intervention). Qualitative strand: I will not accept informed consent before leaving the face-to-face training to avoid undue influence and will also try to avoid hard copies and emails with pictures attached. The day after the in-person training, I will send an email with a link to a form in Microsoft Forms (using the Oxford University account) for teachers to complete their name and agree to participate if they are willing to do so (appendix 9). I will attach to this email the information sheet set out at the end of the face-to-face training and will also include this information in the header of the form.
10. Provide details of any payments and incentives and the rationale for providing these. Further guidance in Best Practice Guidance: 05 Payments and incentives in research.	
None	
11. Describe how participants • may withdraw from the study • may withdraw any personal information they have provided from the study State any limits to withdrawal, for example once the data has been anonymised or at some other specified stage prior to publication. Make sure participants are aware of any withdrawal limits.	Participants may withdraw from the study at any time before the data analysis phase finishes. This limit to withdrawal will be explicitly specify in the information sheet.

SECTION E: Research data
All information provided by participants is considered research data for the purpose of this form. Any research data from which participants can be identified is known as personal data; any personal data which is sensitive is considered special category data. Management of personal data, either directly or via a third party, must comply with the requirements of the UK General Data Protection Regulation (UK GDPR) and the Data Protection Act 2018, as set out in the University's Guidance on Data Protection and Research. In answering the questions below, please also consider the points raised in the Data Protection Checklist and Data Protection Screening Assessment and whether, for higher-risk data processing, a separate Data Protection Impact Assessment may also be required for the research. Advice on research data management and security is available from Research Data Oxford and your local IT department. Advice on data protection is available from the Information Compliance team.

For guidance on conducting internet-mediated research, refer to CUREC's Best Practice Guidance 06: Internet-mediated research.

1. What data will be collected? (Indicate with an '**X**')

Screening documents	☐	Task results (e.g. questionnaires, diaries)	☒
Consent records (e.g., written consent forms, audio-recorded consent, assent forms)	☒	IP addresses (refer to Best Practice Guidance 09: Data collection, protection and management for guidance)	☐
Contact details for the purpose of this research only	☒	Field notes	☒
Contact details for future use (guidance)	☐	Photographs	☐
Opt-out forms	☐	Information about the health of the participant (including mental health)	☐
Audio recordings	☐	Previously collected (secondary) data	☐
Video recordings	☐	Data already in the public domain. Specify the source of the data:	☐
Transcript of audio/ video recordings	☐	Other, please specify:	☐

2. During the course of the research, where will **each type of** research data be stored?

Contact details: I will store the identity of all the teachers who have submitted their informed consent in the Microsoft account provided by the University of Oxford. Every participant will be anonymised by assigning them a participation code which will be used in the data analysis.

Written consent forms: I will store participants' written informed consent in digital format in the Nexus 365 account of the University of Oxford. For the questionnaire, it will be recorded in the Forms file as a 'Yes' to the question in the first section. For the qualitative strand, it will be recorded in the Forms file including their data and the answer 'Yes' to the question about their agreement to participate. Both files will be exported to Excel and stored in a folder called 'Informed consents' in the OneDrive application of the Nexus 365 of the Oxford University account.

Task results:
a) The results of the questionnaire will be stored within the university's Nexus 365 account in three formats: Microsoft forms, Microsoft Excel, and SPSS files.

b) Teachers' reflections and performance are an integral part of the institutional professional development programme and thus they will take place within the community of practice hosted in the institutional Microsoft Teams. However, their analysis will be stored in the above-mentioned Nexus 365 account. This analysis will include files in several formats such as Word, Excel, OneNote, and NVivo 12. In their reflections, teachers might comment on how named pupils reacted. If that were the case, I will anonymise them.

Field notes: they will be stored in the form of a research journal using the OneNote application included in the university's Nexus 365 account.

All the data will be retained for as long as they are of continuing value to the researcher and the wider research community.

3. Who will have access to the research data during the project?			
As the raw data concerning teachers' reflections and performance come from the mutual interaction between me and participants within the community of practice hosted in my institution's Microsoft Teams, they will be accessible to all the participants, to me as the teacher educator, and to the Head of the Pedagogic Area of my institution. However, the informed consents, the raw data concerning the questionnaire and the analysis of teachers' reflections and performance will be stored in my Oxford Nexus 365 account and only accessible to me and to my supervisors (Nigel Fancourt and Ariel Lindorff). These data will not be shared with people external to the University of Oxford.			
4. Please complete this section if your research involves the use of secondary (i.e. previously collected) data.	**Please indicated with an 'X'.**	**Yes**	**No**
	Are data access agreements in place for access to and use of this secondary data? (If so, please attach these.)	☐	☐
	Did the individuals agree that their data could be used for this purpose?	☐	☐
	Could anyone (including members of the research team) link the data back to an individual or individuals? If this is a possibility, please explain how the associated ethical issues will be addressed:	☐	☐
5. How do you intend to share the research data at the end of the project?	Depositing in a specialist data centre or archive	☐	
	Submitting to a journal to support a publication	☐	
	Depositing in an institutional repository	☐	
	Dissemination via a project or institutional website	☐	
	No plans to share the data	☒	
	Other (please specify):	☐	
6. How do you intend to report and disseminate the results of the research? (Indicate with an 'X')	Thesis publication	☐	
	Publication in a peer reviewed journal	☒	
	Publicly available report	☐	
	Conference presentation	☒	
	Publication on a website	☐	
	Pre-registration	☐	
	Report to a research funder	☐	
	Providing participants with a lay summary of the results	☒	
	Submission for academic assessment	☒	
	Other (please specify): Providing my institution with a detailed summary of the results	☒	
7. Explain what will happen to the data at the end of the research project. This question must be answered for each type of data, including completed consent forms.			
I will remove the file including the name and the code of participants and also the files including their informed consents from the Nexus 365 account once the research project has finished, which will erase the participants' personal data that was being stored for the project.			

All the research data (including consent forms, tasks results, the analysis of teachers' reflections and performance, and field notes) will be safely stored for at least 3 years after a possible final publication or public release and then removed. My supervisors will be responsible for ensuring that the data are securely deleted if I have no longer access to the university's Nexus 365 account. The raw data stored in the institutional Microsoft Teams will keep existing as the initial step of a thriving community of practice which is intended to be permanent.

SECTION F: Protection of research participants and their personal data		
1. How identifiable will the participants be from the research outputs? (Indicate with an 'X')	Directly identifiable from the information included	☐
	Pseudonymised/ indirectly identifiable	☐
	Not identifiable – data is anonymous	☐
	Other, please specify: Indirect identifiability might be possible in the qualitative strand depending on the level of detail when reporting the findings arising from teachers´ reflections and artifacts.	☒
2. To what extent will the **data** be de-identified? How identifiable will any individuals be from the research data? Describe any measures you will take towards assuring confidentiality, potential risks to confidentiality.		
In the online questionnaire, participants will be coded and de-identified using a unique number across all analyses. In the qualitative strand where data is taken from the community of practice, teachers' identity at the point of it being shared in this community will be identifiable (as this is the normal practice in this setting). However, that a teacher is taking part in the study will not be made known among the community of practice. In my analysis, participants will be coded and de-identified using a unique number across all analyses.		
3. How will you ensure that third parties (e.g., interpreters and transcribers) are aware of and adhere to the measures described in this form?		
There will be no third parties involved during this research project.		

SECTION G: Risks and benefits of the research
1. Will the research involve topics that could be considered sensitive? If so: a. Please provide more detail or supporting information (such as the interview questions) to show the range of questions; b. Explain what steps will be taken to reduce risk of distress; c. Consider seeking advice from within your Department or from the ethics committee including whether the application might benefit from additional ethics review (e.g., via a CUREC 2 application).
No sensitive data will be collected.
2. Describe any additional burden or risks to the participants and the steps you will take to address these.
There is small burden upon participants in the form of the time it takes to complete the questionnaire. The questionnaire is very short and easy to fill in to ensure this burden is as small as possible.

The qualitative strand will use data that will be naturally created as integral part of the professional development programme, so no additional burden is placed on participants.
3. Describe any physical or psychological risks to the researcher(s) (including local fieldworkers or research assistants) and the steps you will take to address these.
There are neither physical nor psychological risks to me as the researcher.
4. Describe any benefits of the research, both to participants and to others.
The research will provide very valuable insights into the dynamics of the factors influencing the possible development of participants' teaching beliefs, helping the school federation maximise the opportunities for their professional growth by best designing future professional development programmes in the light of the findings.
5. Give details of any other ethical issues or relevant information.
Participants might feel obliged to take part due to my senior role in the institution. In order to reduce this felt obligation, special emphasis will be placed on how the project is voluntary. The study raises some issues of positionality, as I am a researcher exploring my own practice in my own institution Firstly, the continuous professional development programme used to answer the research questions of the study builds on a disruptive pedagogy that I am pioneering both in Spain at large and worldwide at secondary level. My study might well be influenced by my interest in supporting my personal teaching practice and in justifying my pedagogical convictions. Secondly, this programme has been developed and promoted by me as a teacher educator and as an institutional leader, being replicated and promoted internationally through a project funded by Erasmus+; one that is led by myself. I might be tempted to use the results of the study to urge other organisations to adopt the programme or to use it in new Erasmus+ applications. Finally, I could use the results of my study to enhance my professional reputation as a means to improve my leadership position within my institution, to be offered leadership roles by other organisations, to act as a leading teacher educator, to be recognised as a leader of educational change, or to become one of the international experts of the type of pedagogy underpinning the programme used by the study. I cannot avoid these conflicts, but I will try to manage them by making the results of the study as trustworthy as possible. In particular, I will try to maximise reflexivity and transparency by accounting for any decision that might have an impact on the research process. I will also keep a thorough record of what has been done, how, when, and why to provide anyone interested in understanding, replicating, or challenging the study or its findings with compelling evidence. Part of this record will be a detailed, easy-to-navigate research journal digitally kept in Microsoft OneNote, and everything will be recorded by making the most of the tools available in the Microsoft Office 365 account provided by the University of Oxford.

SECTION H: Professional guidelines	
Please indicate with an '**X**' at least one set of professional guidelines you will follow.	
Research specialism/ methodology	**Association and guidance**

Anthropology	Association of Social Anthropologists of the UK	☐
Computer Science	ACM Code of Ethics and Professional Conduct	☐
Criminology	British Society of Criminology Statement of Ethics	☐
Education	British Educational Research Association Ethical Guidelines for Educational Research	☒
Geography	American Association of Geographers Statement on Professional Ethics	☐
History	Oral History Society of the UK Ethical Guidelines	☐
Internet-mediated research	Association of Internet Researchers Ethical Guidelines British Psychological Society: Ethics Guidelines for internet-mediated research Association for Computing Machinery Code of Ethics and Professional Conduct	☐
Management	Academy of Management Code of Ethics	☐
Political Science	American Political Science Association (APSA) Guide to Professional Ethics in Political Science	☐
Politics	Political Studies Association. Guidelines for Good Professional Conduct	☐
Psychology	British Psychological Society Code of Ethics and Conduct	☐
Social research	Social Research Association: Ethical Guidelines	☐
Socio-legal studies	Socio-Legal Studies Association: Statement of Principles of Ethical Research Practice	☐
Sociology	The British Sociological Association: Statement of Ethical Practice	☐
Visual research	ESRC National Centre for Research Methods Review Paper: Visual Ethics: Ethical Issues in Visual Research	☐
Other professional guidelines		☐

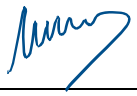
SECTION I: Endorsements and signatures

Please ensure this form is endorsed by the Principal Investigator (or student's supervisor), the Head of Department (or nominee) and, if student research, by the student themselves.
The SSH IDREC Secretariat accepts either option below. If you have a DREC, check which signature option it prefers.

- **Option 1: direct email endorsements**
  Each of the signatories should submit an email from a University of Oxford email address, indicating their acceptance of the responsibilities listed below.
- **Option 2: signatures**
  Please scan the signed form and email it to us as a PDF. Pasted images of signatures cannot be accepted.

Endorsement by the Principal Investigator/ student supervisor and student, if applicable

We the researchers understand our responsibilities as Principal Investigator and student as outlined in the guidance on the CUREC website. We declare that the answers above accurately describe the research as presently designed, and that the ethics committee will be informed of any changes to the project which affect the answers to this form.
We will inform the relevant IDREC if the Principal Investigator changes.

Name of Principal Investigator	Nigel Fancourt
Principal Investigator's signature	
Date	
Name of student (if applicable)	Oscar Urmeneta
Student's signature	
Date	9 April 2022

Departmental endorsement – from the Head of Department or nominee (Another senior member of the department may sign where the head of department is the Principal Investigator, or where the Head of Department has appointed a nominee. Example nominees include Deputy Head of Department, Director of Research, or Director of Graduate/ Undergraduate Studies.)	
On the basis of the information available to me, I confirm that: • I am aware of the research proposed and have read this application; • To the best of my knowledge, the proposed design and scientific methodology do not raise ethical concerns; • I support this research in principle, subject to ethical and other necessary reviews.	
Signature	
Name	
Role	
Date	

Appendix 17: Notice of CUREC approval



Hamish Chalmers

To: Oscar Urmeneta

Cc: Nigel Fancourt

Mon 2022-04-25 17:11

You replied on Wed 2022-04-27 06:22

Dear Oscar

Title: The development of teachers' teaching beliefs in response to continuous professional development: an intervention study

Ref: CIA-22HT-084

The above application has been considered on behalf of the Departmental Research Ethics Committee (DREC) in accordance with the procedures laid down by the University for ethics approval of all research involving human participants.

I am pleased to inform you that, on the basis of the information provided to DREC, the proposed research has been judged as meeting appropriate ethical standards, and accordingly, approval has been granted.

If your research involves participants whose ability to give free and informed consent is in question (this includes those under 18 and vulnerable adults), then it is advisable to read the following NSPCC professional reporting requirements for cases of suspected abuse
http://www.nspcc.org.uk/globalassets/documents/information-service/factsheet-child-abuse-reporting-requirements-professionals.pdf

Should there be any subsequent changes to the project which raise ethical issues not covered in the original application you should submit details to research.office@education.ox.ac.uk for consideration.

Good luck with your research study.

Best wishes

Hamish Chalmers
Member of the DREC

Dr Hamish Chalmers
Departmental Lecturer in Applied Linguistics and SLA
15 Norham Gardens, Oxford, OX2 6PY
Tel: +44 (0)1865 284 091
Email: hamish.chalmers@education.ox.ac.uk

Appendix 18: Amended CUREC Form 1A

Central University Research Ethics Committee (CUREC)

CUREC 1A Form for Application for research projects in the social sciences and humanities with less complex ethical issues

The University of Oxford places a high value on the knowledge, expertise, and integrity of its members and their ability to conduct research to high standards of scholarship and ethics. The research ethics review process has been established to ensure that research involving human participants is conducted in a way that respects the dignity, rights, and welfare of participants, and minimises risk to participants, researchers, third parties, and to the University itself. It is assumed that all members of the University will take their responsibilities and obligations seriously and will ensure that their research involving human participants is conducted according to established principles and good practice in their field and in accordance, where appropriate, with legal requirements.

Before completing this form, please refer to the guidance and flowchart on the Research Support website. Only type-written forms will be accepted. Completed application forms should be emailed, along with relevant supporting documents, to your Departmental Research Ethics Committee (DREC) or to ethics@socsci.ox.ac.uk from your ox.ac.uk email address.

Please contact your DREC or the SSH IDREC if you have any questions about completing this form or the review process.

SSECTION A: Filter for CUREC 2 application		
This section determines whether the application for ethics review should be made using this form (CUREC 1A) or the CUREC 2 form (for research with more complex ethical issues).		
Please indicate with an 'X'.	**Yes**	**No**
6. Does the research involve the deception of participants?	☐	☒
7. Are the research participants vulnerable in the context of the research, or classed as people whose ability to give free and informed consent is in question? For example, • Participants aged 16 or under (also answer question A5); • Participants aged 16 – 18 (refer to competent youths for guidance); • adults at risk; Note the University's Safeguarding Guidance and Code of Practice and its implications for researchers involving young people or adults at risk.	☐	☒
8. By taking part in the research, will participants be at risk of criminal prosecution or significant harm?	☐	☒
9. Does your research raise issues relevant to the Counter-Terrorism and Security Act (the Prevent Duty), which seeks to prevent people from being drawn into terrorism? Best Practice Guidance 07 on the Prevent Duty provides further guidance.	☐	☒
If you answered **'No'** to all the questions above, go to Section B. If you answered **'Yes'** to any question above, continue to question 5 below.		
10. Is your project covered by a CUREC Approved Procedure?	☐	☐
If yes, list the CUREC Approved Procedure(s) you will follow		
If you have answered '**No**' to all questions 1-4, go on to **Section B**. If you answered '**Yes**' to ANY of questions 1-4, and answered '**No**' to question 5, **stop** completing this form and do not submit it for ethical review. You will instead need to submit a CUREC 2 application form. If		

you answered '**Yes**' to **any** of questions 1-4, and your project is covered by an Approved Procedure, **go on to Section B**. If more than one Approved Procedure applies, contact the SSH IDREC or your DREC for advice on whether a CUREC 2 form should be submitted instead.		
SECTION B: Researchers		
11. Name of Principal Investigator or student's supervisor	Nigel Fancourt	
12. Department or Institute	Department of Education	
13. University of Oxford email address	nigel.fancourt@education.ox.ac.uk	
Copy and paste the following six rows as necessary to complete for each additional researcher who will be involved in this study, including student(s) and those external to the University.		
14. Name of researcher or student	Oscar Urmeneta	
15. Department or Institute	Department of Education	
16. University of Oxford email address	oscar.urmeneta@education.ox.ac.uk	
17. Role in research	Student	
18. Degree programme, if student research	DPhil (part time)	
The whole research team		
19. Have the researchers undertaken research ethics and integrity training?	**Yes** ☒	**No** ☐
20. Please provide details of any research ethics and integrity training undertaken, including the dates of the training. Alternatively state relevant research experience.	a) Research integrity – core course (9/1/2022) b) Supplementary modules: - Conflicts of interest (5/3/2022) - Research involving human participants (6/3/2022)	
11. State any conflicts of interest and explain how these will be addressed.		
There is neither a financial nor a non-financial conflict of interest. The study raises some issues of positionality, discussed in section G.5, as I am researching my own institution.		

SECTION C: The research project
14. Title of the research project
The development of teachers' teaching beliefs in response to continuous professional development: an intervention study.
15. Anticipated start date of the aspect of the research project involving human participants and/ or personal data. — 1/6/22
16. Anticipated research end date. — 30/6/27
17. Provide a brief lay summary of the aims and objectives of the research. This should cover the questions it will answer and any potential benefits. (max 300 words)
Teacher educators and school leaders strongly committed to transforming teaching practices rely on the power of continuous professional development to help teachers grow and develop their teaching beliefs. However, the issue whether and how teachers' beliefs develop over

time is under-researched, and the development of experienced teachers' teaching beliefs in particular remains virtually unexplored.

As a teacher educator and the leader of the training strategy of my school federation, I aim to understand how post-secondary teachers' teaching beliefs develop in response to long-term, continuous professional development by exploring to what extent and how the teaching belief profiles of a group of 60 teachers from 11 schools across Spain change during their participation in an institutional 2-year blended programme.

Given the elusive and highly situated nature of teachers' beliefs, I will adopt an ecological approach, addressing the following two research questions from three different perspectives (what teachers explicitly report on their own beliefs, their lived experiences, and their performance during the programme):

a) To what degree do teachers' teaching belief profiles change in response to the 2-year continuous professional development programme, if at all?
b) How does teachers' personal and contextual factors (e.g., years of teaching experience, school subject, school leadership…) influence this change in teachers' teaching belief profiles, or the lack of it?

Seeking for consistency and complementarity between the answers to these two questions from the above-mentioned perspectives will allow me to better infer the evolution of teachers' teaching beliefs and understand how best to help them grow professionally and adapt their teaching practices.

18. Please indicate the methods to be used (indicate with an '**X**'):	
Analysis of existing records	☐
Snowball sampling (recruiting through contacts of existing participants)	☐
Use of casual or local workers e.g. interpreters (refer to guidance in BPG 01: Researcher safety)	☐
Participant observation	☐
Covert observation	☐
Observation of specific organisational practices	☐
Participant completes questionnaire in hard copy	☐
Participant completes online questionnaire or other online task (refer to guidance in BPG 06: Internet-mediated research)	☒
Using social media to recruit or interact with participants (refer to guidance in BPG 06: Internet-mediated research)	☐
Participant performs paper and pencil task	☐
Participant performs verbal or aural task (e.g. for linguistic study)	☐
Focus group	☐
Interview (refer to guidance in BPG 10: Conducting research interviews)	☐
Audio recording of participant (you will generally need specific consent from participants for this)	☐
Video recording of participant (you will generally need specific consent from participants for this)	☐

Photography of participant (you will generally need specific consent from participants for this)	☐
Others (please specify below) Participant interacts/reflects within the institutional online community of practice Participant shares lesson plans within the institutional online community of practice Participants training as mentors share evaluations of lesson plans by other participants	☒

19. Provide a brief summary of the research design and methods. What will research participants be asked to do? (max 300 words)
Please also submit a copy of the questions participants will be asked, if applicable, or some information about the sorts of topics that will be covered.

This research is a single, longitudinal case study in the form of a panel study, tracking exactly the same 60 teachers across their participation in a 2-year continuous professional development programme. It adopts a mixed-method approach with a convergent, parallel design, collecting quantitative and qualitative data from three different perspectives separately and putting them together.

As a practitioner researcher, I will make the most of the information naturally gathered during the programme, minimising the collection of data that respond exclusively to my needs as a researcher.

In this sense, the data dealing with the perspectives on teachers' lived experiences and their performance will be naturally gathered as integral part of the school intervention through online portfolios; ones that are conformed by teachers' interaction with me as the teacher educator or with other participants across 2 academic years within the online community of practice hosted in the institutional Microsoft Teams. These interactions (appendix 1) will include both reflections on their experience and artifacts in the form of lesson plans (appendix 2). The collection of these qualitative data will take place throughout the whole school intervention a far as teachers progress in their participation in the programme. I will also gather evaluations of 4-8 lesson plans (appendix 10) from approximately 4 participants training as mentors as an integral part of institutional practice. These mentor trainees will be a subset of the questionnaire respondents, as will the teachers whose lesson plans they evaluate as part of their mentor training. Evaluations will be analysed alongside my own feedback on lesson plans to critically assess the suitability of my feedback approach.

However, gathering teachers' explicit opinion about their own teaching beliefs is not an integral part of the school intervention, and the data collection should be non-intrusive and comfortable for participants, with no implications for their educational experience. Accordingly, I will ask all post-secondary teachers at the school federation (not only participants in the programme) to voluntarily and anonymously complete a short, online, closed-ended questionnaire (appendix 3) (rather than to participate in online interviews), using the Microsoft Forms application that is included in the Nexus365 account provided by the University of Oxford. I will ask teachers to submit the questionnaire three times (just before the school intervention, after year 1, and after year 2).

20. List the location(s) where the research will be conducted, including any other countries.	Spain: Pamplona, Lugo, Zaragoza, Huesca, Madrid, Badajoz, Algeciras, Chipiona, Cuenca, Castellón

21. Clarify which parts of the research will be conducted in-person and which will take place remotely, e.g. online.	Although the school intervention is blended and includes initial in person training, all the data are collected in digital format and all the research takes places remotely.	
22. If your research involves fieldwork or travel and your department requires a travel risk assessment, will you have completed and returned a risk assessment form beforehand? Please indicate with an '**X**'. (This must be approved by your department before you travel. If you are travelling overseas, you are advised to take out University travel insurance.) Refer to guidance available from your Department, the Safety Office, the Social Sciences Division, and the Humanities Division, and on travel for University business.	Yes	☐
	No	☐
	Not required in this instance	☒
23. In the case of international or collaborative research, explain how you will address any ethical issues specific to the local context. Please provide details of the local review, approval or permission obtained or required. Refer to the BPG 16: Social science research conducted outside the UK. If there will be no local review, explain why not. Please mention any stakeholder or community engagement that has been/ will be undertaken in relation to the research. Please also address any physical or psychological risks for Oxford researchers and local fieldworkers in Section G.		
While the study addresses a continuous professional development programme in Spain, the Federation´s Steering Committee officially approved the research without requiring additional ethical review other than the CUREC approval. It is straightforward and very unlikely to cause any harm. The data are not sensitive and will be naturally collected as integral part of the programme (except a very short, simple questionnaire) with no interviews. The research is in the interest of the school federation (Fundación Educación Católica, FEC) and was officially approved and encouraged by its Steering Committee in September 2021.		
24. Name of departmental/ peer reviewer (if applicable)	Not applicable	
25. External organisation funding the research and grant reference (if applicable)	Not applicable	
26. Please refer to the CUREC Best Practice Guidance and list any that have been used to develop your research.	BPG 06 Internet-mediated research BPG 09 Data collection, protection and management BPG 16 Social science research conducted outside the UK	

SECTION D: Recruitment of research participants
1. Number of participants
- About 200 teachers in the quantitative strand (questionnaire) - About 64 teachers in the qualitative strand - 60 teachers (reflections and performance) - 4 teachers (evaluation of lesson plans)
2. How was the number of participants decided?
In the questionnaire, participation is non-intrusive and will take teachers 5 minutes. As my intention is to have a roughly comparable control group, I expect that the great majority of the federation´s post-obligatory, secondary teachers (about 215) agree to participate.

The number of participants in the qualitative strand creating lesson plans and providing reflections seeks to enable that the findings are as representative and accurate as possible. As participation does not require that participants do any additional task, I expect that all participants in the professional development programme agree to participate in the research. The number of participants providing evaluation of lesson plans seeks to help me validate my own analysis of lesson plans, taking them acting as "critical friends".

3. Age range of participants

18 and over

4. Inclusion criteria

Questionnaire: all the post-secondary teachers at the school federation who are willing to participate.
Reflections and lesson plans: all the teachers participating in the professional development programme who are willing to participate.
Evaluation of lesson plans: all the teachers participating in the stage of the professional development programme aiming to prepare them as prospective mentors of other teachers.

5. Exclusion criteria	None	
6. Indicate with an '**X**' all intended recruitment methods **Please submit copies of the recruitment material that will be used, e.g. advertisement text, introductory email text.**	Poster advert	☐
	Flyer	☐
	Email circulation	☒
	Social media (e.g. Twitter, Facebook)	☐
	Website	☐
	In-person approach	☒
	Snowball sampling	☐
	Recruitment sites (e.g. Mechanical Turk)	☐
	Existing contacts or volunteer database	☒
	Other (please specify):	☐

7. How will potential participants be identified and approached?

Questionnaire: potential participants have been identified using the current teaching staff list of the school federation and will be approached directly by myself. Using my Oxford University account, I will send them an email with the link to the questionnaire (appendix 4) and an information sheet attached (appendix 5).

Teachers sharing lesson plans and reflections: potential participants have already been identified by the headteachers, who have selected the teachers taking part in the professional development programme. They will be approached in person by myself. As the teacher educator and the researcher, I will inform them at the end of the initial face-to-face training of the programme by projecting and explaining the information sheet (appendix 6) that I will send them later using the email list provided by the organisation (appendix 7).

Teachers evaluating lesson plans: potential participants have already been identified by the institution, as they are the 4 teachers being trained to become mentors of others within the school federation. Using my University of Oxford account, I will send them an email (appendix 11) asking them to become "critical friends" by giving me their informed consent through an online form (appendix 12), attaching an information sheet to the mail (appendix 13).

8. Will informed consent be obtained from the research participants or their parents/ guardians? If not, please explain why not.	Yes

9. For each activity or group of participants, explain how informed consent will be obtained from the participants themselves and/ or their parents/ guardians, if applicable. How will their consent be recorded? **Please submit copies of all participant-facing materials for review.** E.g.: • Recruitment material (e.g. emails, posters) • Information for participants to read (or hear) before they agree to take part (e.g. written information or, if applicable, an outline oral information script). • A document to record informed consent. Further guidance and templates.	Informed consent will be obtained from the participants themselves. Questionnaire: to simplify the process, I will inform about the study, obtain the informed consent, and collect the data at the same time. The questionnaire will be completed anonymously using the Microsoft Forms application included in my Oxford University Office 365 account. The questionnaire will have two sections. The first section will have only one question asking participants for their informed consent (appendix 8). If participants agree to participate, they will continue to the second section with the 17 questions. If they do not agree, the questionnaire will finish. I will follow this process in all three data collection timepoints: baseline (before the intervention), time 1 (during the intervention), and time 2 (after the intervention). Teachers sharing lesson plans and reflections: I will not accept informed consent before leaving the face-to-face training to avoid undue influence and will also try to avoid hard copies and emails with pictures attached. The day after the in-person training, I will send an email with a link to a form in Microsoft Forms (using the Oxford University account) for teachers to complete their name and agree to participate if they are willing to do so (appendix 9). I will attach to this email the information sheet set out at the end of the face-to-face training and will also include this information in the header of the form. Teachers evaluating lesson plans: I will send an email with a link to a form in Microsoft Forms (using the Oxford University account) for "critical friends" to complete their name and agree to participate if they are willing to do so (appendix 11). I will attach to this email an information sheet (appendix 12). Moreover, in the general channel of the institutional community of practice hosted on Microsoft Teams, where teachers share their lesson plans and reflections, I will post a message informing them about the process of some teachers becoming "critical friends" (appendix 14), giving them the opportunity to opt out confidentially if they do not want their lesson plans to be analysed by the "critical friends" by providing a link to a confidential, online opt-out form (appendix 15).

10. Provide details of any payments and incentives and the rationale for providing these. Further guidance in Best Practice Guidance: 05 Payments and incentives in research.	
None	
11. Describe how participants • may withdraw from the study • may withdraw any personal information they have provided from the study State any limits to withdrawal, for example once the data has been anonymised or at some other specified stage prior to publication. Make sure participants are aware of any withdrawal limits.	Participants may withdraw from the study at any time before the data analysis phase finishes. This limit to withdrawal will be explicitly specify in the information sheet.

SECTION E: Research data

All information provided by participants is considered research data for the purpose of this form. Any research data from which participants can be identified is known as personal data; any personal data which is sensitive is considered special category data. Management of personal data, either directly or via a third party, must comply with the requirements of the UK General Data Protection Regulation (UK GDPR) and the Data Protection Act 2018, as set out in the University's Guidance on Data Protection and Research.

In answering the questions below, please also consider the points raised in the Data Protection Checklist and Data Protection Screening Assessment and whether, for higher-risk data processing, a separate Data Protection Impact Assessment may also be required for the research. Advice on research data management and security is available from Research Data Oxford and your local IT department. Advice on data protection is available from the Information Compliance team.

For guidance on conducting internet-mediated research, refer to CUREC's Best Practice Guidance 06: Internet-mediated research.

2. What data will be collected? (Indicate with an '**X**')

Screening documents	☐	Task results (e.g. questionnaires, diaries)	☒
Consent records (e.g., written consent forms, audio-recorded consent, assent forms)	☒	IP addresses (refer to Best Practice Guidance 09: Data collection, protection and management for guidance)	☐
Contact details for the purpose of this research only	☒	Field notes	☒
Contact details for future use (guidance)	☐	Photographs	☐
Opt-out forms	☒	Information about the health of the participant (including mental health)	☐
Audio recordings	☐	Previously collected (secondary) data	☐
Video recordings	☐	Data already in the public domain. Specify the source of the data:	☐

Transcript of audio/ video recordings	☐	Other, please specify:	☐

2. During the course of the research, where will **each type of** research data be stored?

Contact details: I will store the identity of all the teachers who have submitted their informed consent in the Microsoft account provided by the University of Oxford. Every participant will be anonymised by assigning them a participation code which will be used in the data analysis.

Written consent forms: I will store participants' written informed consent in digital format in the Nexus 365 account of the University of Oxford. For the questionnaire, it will be recorded in the Forms file as a 'Yes' to the question in the first section. For the qualitative strand, it will be recorded in the Forms file including their data and the answer 'Yes' to the question about their agreement to participate. Both files will be exported to Excel and stored in a folder called 'Informed consents' in the OneDrive application of the Nexus 365 of the Oxford University account.

Task results:
a) The results of the questionnaire will be stored within the university's Nexus 365 account in three formats: Microsoft forms, Microsoft Excel, and SPSS files.

b) Teachers' reflections and performance are an integral part of the institutional professional development programme and thus they will take place within the community of practice hosted in the institutional Microsoft Teams. However, their analysis will be stored in the above-mentioned Nexus 365 account. This analysis will include files in several formats such as Word, Excel, OneNote, and NVivo 12. In their reflections, teachers might comment on how named pupils reacted. If that were the case, I will anonymise them.

c) The evaluation of lesson plans conducted by teachers training as mentors will also be stored in the University's Nexus 365 account.

Field notes: they will be stored in the form of a research journal using the OneNote application included in the university's Nexus 365 account.

All the data will be retained for as long as they are of continuing value to the researcher and the wider research community.

3. Who will have access to the research data during the project?

As the raw data concerning teachers' reflections and performance come from the mutual interaction between me and participants within the community of practice hosted in my institution's Microsoft Teams, they will be accessible to all the participants, to me as the teacher educator, and to the Head of the Pedagogic Area of my institution.

However, the informed consents, the raw data concerning the questionnaire and the analysis of teachers' reflections and performance will be stored in my Oxford Nexus 365 account and only accessible to me and to my supervisors (Nigel Fancourt and Ariel Lindorff). These data will not be shared with people external to the University of Oxford.

4. Please complete this section if your research involves the use of secondary (i.e. previously collected) data.	**Please indicated with an 'X'.**	**Yes**	**No**
	Are data access agreements in place for access to and use of this secondary data? (If so, please attach these.)	☐	☐
	Did the individuals agree that their data could be used for this purpose?	☐	☐
	Could anyone (including members of the research team) link the data back to an individual or individuals?	☐	☐

	If this is a possibility, please explain how the associated ethical issues will be addressed:	
5. How do you intend to share the research data at the end of the project?	Depositing in a specialist data centre or archive	☐
	Submitting to a journal to support a publication	☐
	Depositing in an institutional repository	☐
	Dissemination via a project or institutional website	☐
	No plans to share the data	☒
	Other (please specify):	☐
6. How do you intend to report and disseminate the results of the research? (Indicate with an 'X')	Thesis publication	☐
	Publication in a peer reviewed journal	☒
	Publicly available report	☐
	Conference presentation	☒
	Publication on a website	☐
	Pre-registration	☐
	Report to a research funder	☐
	Providing participants with a lay summary of the results	☒
	Submission for academic assessment	☒
	Other (please specify): Providing my institution with a detailed summary of the results	☒

7. Explain what will happen to the data at the end of the research project.
This question must be answered for each type of data, including completed consent forms.

I will remove the file including the name and the code of participants and also the files including their informed consents from the Nexus 365 account once the research project has finished, which will erase the participants' personal data that was being stored for the project.

All the research data (including consent forms, tasks results, the analysis of teachers' reflections and performance, and field notes) will be safely stored for at least 3 years after a possible final publication or public release and then removed. My supervisors will be responsible for ensuring that the data are securely deleted if I have no longer access to the university's Nexus 365 account. The raw data stored in the institutional Microsoft Teams will keep existing as the initial step of a thriving community of practice which is intended to be permanent.

SECTION F: Protection of research participants and their personal data		
3. How identifiable will the participants be from the research outputs?	Directly identifiable from the information included	☐
	Pseudonymised/ indirectly identifiable	☐
	Not identifiable – data is anonymous	☐
	Other, please specify:	

(Indicate with an 'X')	Indirect identifiability might be possible in the qualitative strand depending on the level of detail when reporting the findings arising from teachers´ reflections and artifacts.	☒

4. To what extent will the **data** be de-identified? How identifiable will any individuals be from the research data? Describe any measures you will take towards assuring confidentiality, potential risks to confidentiality.

In the online questionnaire, participants will be coded and de-identified using a unique number across all analyses.

In the qualitative strand where data is taken from the community of practice, teachers' identity at the point of it being shared in this community will be identifiable (as this is the normal practice in this setting). However, that a teacher is taking part in the study will not be made known among the community of practice. In my analysis, participants will be coded and de-identified using a unique number across all analyses.

3. How will you ensure that third parties (e.g., interpreters and transcribers) are aware of and adhere to the measures described in this form?

There will be no third parties involved during this research project.

SECTION G: Risks and benefits of the research

6. Will the research involve topics that could be considered sensitive? If so:
   a. Please provide more detail or supporting information (such as the interview questions) to show the range of questions;
   b. Explain what steps will be taken to reduce risk of distress;
   c. Consider seeking advice from within your Department or from the ethics committee including whether the application might benefit from additional ethics review (e.g., via a CUREC 2 application).

No sensitive data will be collected.

7. Describe any additional burden or risks to the participants and the steps you will take to address these.

There is small burden upon participants in the form of the time it takes to complete the questionnaire. The questionnaire is very short and easy to fill in to ensure this burden is as small as possible.
The qualitative strand including teachers' lesson plans and reflections as well as the evaluation of some lesson plans by teachers training as mentors will use data that will be naturally created as integral part of the professional development programme, so no additional burden is placed on participants. Certainly, evaluations of lesson plans by prospective mentors will include possible areas for improvement, but these evaluations will be completely confidential, and the authorship of the lesson plans will be completely anonymised for prospective mentors.

8. Describe any physical or psychological risks to the researcher(s) (including local fieldworkers or research assistants) and the steps you will take to address these.

There are neither physical nor psychological risks to me as the researcher.

9. Describe any benefits of the research, both to participants and to others.

The research will provide very valuable insights into the dynamics of the factors influencing the possible development of participants' teaching beliefs, helping the school federation maximise the opportunities for their professional growth by best designing future professional development programmes in the light of the findings.

10. Give details of any other ethical issues or relevant information.
Participants might feel obliged to take part due to my senior role in the institution. In order to reduce this felt obligation, special emphasis will be placed on how the project is voluntary. The study raises some issues of positionality, as I am a researcher exploring my own practice in my own institution Firstly, the continuous professional development programme used to answer the research questions of the study builds on a disruptive pedagogy that I am pioneering both in Spain at large and worldwide at secondary level. My study might well be influenced by my interest in supporting my personal teaching practice and in justifying my pedagogical convictions. Secondly, this programme has been developed and promoted by me as a teacher educator and as an institutional leader, being replicated and promoted internationally through a project funded by Erasmus+; one that is led by myself. I might be tempted to use the results of the study to urge other organisations to adopt the programme or to use it in new Erasmus+ applications. Finally, I could use the results of my study to enhance my professional reputation as a means to improve my leadership position within my institution, to be offered leadership roles by other organisations, to act as a leading teacher educator, to be recognised as a leader of educational change, or to become one of the international experts of the type of pedagogy underpinning the programme used by the study. I cannot avoid these conflicts, but I will try to manage them by making the results of the study as trustworthy as possible. In particular, I will try to maximise reflexivity and transparency by accounting for any decision that might have an impact on the research process. I will also keep a thorough record of what has been done, how, when, and why to provide anyone interested in understanding, replicating, or challenging the study or its findings with compelling evidence. Part of this record will be a detailed, easy-to-navigate research journal digitally kept in Microsoft OneNote, and everything will be recorded by making the most of the tools available in the Microsoft Office 365 account provided by the University of Oxford.

SECTION H: Professional guidelines		
Please indicate with an '**X**' at least one set of professional guidelines you will follow.		
Research specialism/ methodology	**Association and guidance**	
Anthropology	Association of Social Anthropologists of the UK	☐
Computer Science	ACM Code of Ethics and Professional Conduct	☐
Criminology	British Society of Criminology Statement of Ethics	☐
Education	British Educational Research Association Ethical Guidelines for Educational Research	☒
Geography	American Association of Geographers Statement on Professional Ethics	☐
History	Oral History Society of the UK Ethical Guidelines	☐
Internet-mediated research	Association of Internet Researchers Ethical Guidelines British Psychological Society: Ethics Guidelines for internet-mediated research	☐

	Association for Computing Machinery Code of Ethics and Professional Conduct	
Management	Academy of Management Code of Ethics	☐
Political Science	American Political Science Association (APSA) Guide to Professional Ethics in Political Science	☐
Politics	Political Studies Association. Guidelines for Good Professional Conduct	☐
Psychology	British Psychological Society Code of Ethics and Conduct	☐
Social research	Social Research Association: Ethical Guidelines	☐
Socio-legal studies	Socio-Legal Studies Association: Statement of Principles of Ethical Research Practice	☐
Sociology	The British Sociological Association: Statement of Ethical Practice	☐
Visual research	ESRC National Centre for Research Methods Review Paper: Visual Ethics: Ethical Issues in Visual Research	☐
Other professional guidelines		☐

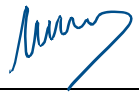
SECTION I: Endorsements and signatures

Please ensure this form is endorsed by the Principal Investigator (or student's supervisor), the Head of Department (or nominee) and, if student research, by the student themselves.
The SSH IDREC Secretariat accepts either option below. If you have a DREC, check which signature option it prefers.

- **Option 1: direct email endorsements**
  Each of the signatories should submit an email from a University of Oxford email address, indicating their acceptance of the responsibilities listed below.
- **Option 2: signatures**
  Please scan the signed form and email it to us as a PDF. Pasted images of signatures cannot be accepted.

Endorsement by the Principal Investigator/ student supervisor and student, if applicable

We the researchers understand our responsibilities as Principal Investigator and student as outlined in the guidance on the CUREC website. We declare that the answers above accurately describe the research as presently designed, and that the ethics committee will be informed of any changes to the project which affect the answers to this form.
We will inform the relevant IDREC if the Principal Investigator changes.

Name of Principal Investigator	Nigel Fancourt
Principal Investigator's signature	
Date	
Name of student (if applicable)	Oscar Urmeneta
Student's signature	
Date of the CUREC amendment	15 January 2023

Departmental endorsement – from the Head of Department or nominee (Another senior member of the department may sign where the head of department is the Principal Investigator, or where the Head of Department has appointed a nominee. Example nominees include Deputy Head of Department, Director of Research, or Director of Graduate/ Undergraduate Studies.)	
On the basis of the information available to me, I confirm that: • I am aware of the research proposed and have read this application; • To the best of my knowledge, the proposed design and scientific methodology do not raise ethical concerns; • I support this research in principle, subject to ethical and other necessary reviews.	
Signature	
Name	
Role	
Date	

Appendix 19: Social Sciences and Humanities IDREC Amendment Form

CENTRAL UNIVERSITY RESEARCH ETHICS COMMITTEE (CUREC)

Social Sciences and Humanities IDREC Amendment Form

The IDREC or DREC that approved the original ethics application must be informed of any amendments. This can be via email for minor amendments (such as a change of investigators or to the research end date), but this form should be used for any more substantial amendments.

Information about the process for amending projects in light of COVID-19 is available at https://researchsupport.admin.ox.ac.uk/governance/ethics/coronavirus.

Please complete electronically and submit by email to the committee that reviewed the original ethics application, along with your amended ethics application form and any amended or new supporting documents. Using track changes or a different colour to indicate the amendments would help speed up the review process.

Principal Investigator	
Name	Nigel Fancourt
Name of student *(if student research)*	Oscar Urmeneta
Department or Institute	Department of Education
University email address	oscar.urmeneta@education.ox.ac.uk

Study Details	
Full title of research study	The development of teachers' teaching beliefs in response to continuous professional development: an intervention study.
CUREC ethics approval reference	CIA-22HT-084
Date of amendment	6th of February 2023
Number of previous amendments submitted since original approval	0

Documents submitted for review	**YES**	**NO**	**New version no.**
Updated CUREC form *(required for most amendments)*	☒	☐	1
Amended recruitment materials	☐	☐	
Amended participant information sheet(s)	☐	☐	

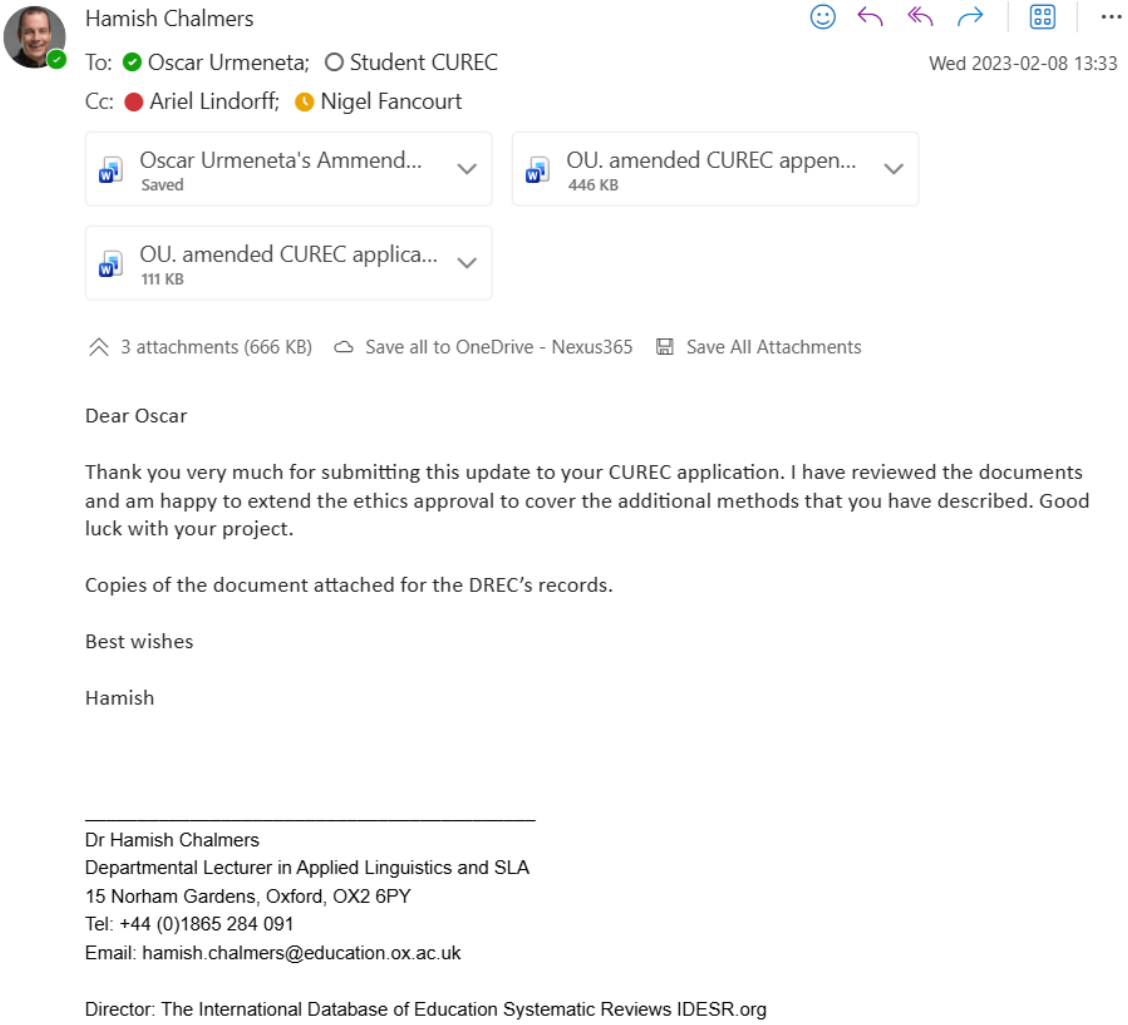
Amended consent form(s)	☐	☐	
Other amended documents *(please list)*	☐	☐	
New documents *(please list)* - *Evaluation of lesson plans by prospective mentors* - *Email asking potential participants to become "critical friends"* - *Online form for informed consent of potential "critical friends"* - *Information sheet for potential "critical friends"* - *Information and possibility of opting out from being assessed by "critical friends"* - *Opt-out online form*	☒	☐	

Main changes proposed in this amendment

Please list the changes proposed with reasons for making the change in the table below. Refer to the examples provided at the top of the table and add further lines if required.
There is no requirement to detail the exact changes made to each document, since these will be shown as tracked changes on the document.

Proposed change	Reason
Example: Extension of REC approval from current end date of 31 Dec 2020 to 31 Dec 2021	*Example: Recruitment has been slow*
Example: Addition of a new sub-study	*Example: Findings to date have been interesting and we would like to include further investigations to corroborate our data*
1. Consideration of some participants as "critical friends".	I would like to evaluate the suitability of my feedback on teacher participants' lesson plans by comparing it with the feedback given by four participants who are being trained as mentors in the same school intervention.
2.	
3.	
4.	

Appendix 20: Notice of approval of CUREC amendment



Hamish Chalmers

To: Oscar Urmeneta; Student CUREC

Wed 2023-02-08 13:33

Cc: Ariel Lindorff; Nigel Fancourt

Oscar Urmeneta's Ammend...
Saved

OU. amended CUREC appen...
446 KB

OU. amended CUREC applica...
111 KB

3 attachments (666 KB) Save all to OneDrive - Nexus365 Save All Attachments

Dear Oscar

Thank you very much for submitting this update to your CUREC application. I have reviewed the documents and am happy to extend the ethics approval to cover the additional methods that you have described. Good luck with your project.

Copies of the document attached for the DREC's records.

Best wishes

Hamish

Dr Hamish Chalmers
Departmental Lecturer in Applied Linguistics and SLA
15 Norham Gardens, Oxford, OX2 6PY
Tel: +44 (0)1865 284 091
Email: hamish.chalmers@education.ox.ac.uk

Director: The International Database of Education Systematic Reviews IDESR.org

Appendix 21: information sheet for the questionnaire

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION

15 Norham Gardens, Oxford OX2 6PY
Tel: +44(0)1865 274024 Fax: +44(0)1865 274027
general.enquiries@education.ox.ac.uk www.education.ox.ac.uk

Supervisors: Nigel Fancourt & Ariel Lindorff

Researcher: Oscar Urmeneta

The development of teachers' teaching beliefs in response to continuous professional development
Information for Participants

Invitation

You are being invited to take part in a research study. Before you decide to participate, it is important to understand why the research is being conducted and what your participation entails. Please take time to read the following information carefully. Please ask if there are any aspects of the project that are unclear or if you would like more information. Take time to decide whether or not you would like to participate.

What is the purpose of the study?

This longitudinal study is an exploration of how post-obligatory, secondary teachers' teaching beliefs develop over time. It aims to understand how teachers´ personal and contextual situation influences the possible change in their teaching beliefs across two academic years in the Spanish school context.

Why have I been chosen?

For this study, we are seeking the perceptions of both Baccalaureate and vocational education teachers at three different points in time. You have been identified as one of the potential participants at FEC at the first point in time and are being approached using its institutional mailing list. The hope is that through the voluntary participation of a large number of teachers by completing a closed-ended, online questionnaire three times across two different academic years, the most significant and reliable findings can be presented.

Do I have to take part? What are the risks and benefits of taking part?

It is your decision to take part in this first questionnaire of the study, and there are no known risks to taking part. You can decide to stop participating at any time while you are completing the questionnaire. Your identity will be anonymised, and every effort will be made to ensure confidentiality, storing the data securely in a password-controlled server. You can decide to stop participating at any time before the data analysis phase finishes. You do not need to answer all the 14 items if you do not wish to, although I strongly encourage to do so because they are very straightforward and will take no longer than 3 minutes. The benefits of your participation are providing educational research with valuable insights into the dynamics of teachers´ teaching beliefs. Your participation will also help educational institutions support teachers to grow professionally and enhance their teaching practices.

What will happen to the results of this research?

The results of this research will form the basis of an Oxford doctoral dissertation. Some results may be published in academic journals concerned with teachers´ beliefs, educational change, or teacher education. If you wish to obtain a copy of the published results, please inform the researcher. The study will take place over two academic years after which time the published results will be publicly available.

Who is organizing the research?

The research was granted a Judge Scholarship by the Department of Education, University of Oxford, and is organised as an independent doctoral research project at this Department.

Contact for Further Information or Follow-up

Should you have any further questions about this research, please feel free to contact Oscar Urmeneta (oscar.urmeneta@education.ox.ac.uk) or Nigel Fancourt (nigel.fancourt@education.ox.ac.uk). If you remain unhappy or wish to make a formal complaint, please contact the Chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter as soon as possible (ethics@socsci.ox.ac.uk).

Appendix 22: information sheet for the qualitative strand

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION

15 Norham Gardens, Oxford OX2 6PY
Tel: +44(0)1865 274024 Fax: +44(0)1865 274027
general.enquiries@education.ox.ac.uk www.education.ox.ac.uk

Supervisors: Nigel Fancourt & Ariel Lindorff

Researcher: Oscar Urmeneta

The development of teachers' teaching beliefs in response to continuous professional development
Information for Participants

Invitation

You are being invited to take part in a research study. Before you decide to participate, it is important to understand why the research is being conducted and what your participation entails. Please take time to read the following information carefully. Please ask if there are any aspects of the project that are unclear or if you would like more information. Take time to decide whether or not you would like to participate.

What is the purpose of the study?

This longitudinal study is an exploration of how post-secondary teachers' teaching beliefs develop over time, if at all. In particular, it aims to understand how teachers´ personal and contextual situation influences the possible change in their teaching beliefs across two academic years in the Spanish school context.

Why have I been chosen?

For this study, we are seeking the reflections and performance of Baccalaureate and vocational education teachers who participate in the FEC-TBL continuous professional development programme taking place across the academic years 22-23 and 23-24. You have been identified as one of the 60 participants in this programme, and the hope is that through the analysis of your reflections and performance during the programme, the most significant and reliable findings can be presented.

Do I have to take part? What are the risks and benefits of taking part?

It is your decision to take part in this study, and you can decide to stop participating at any time before the data analysis phase finishes. Participation requires no additional task, and there are no known risks to it Your identity will be anonymised, and every effort will be made to ensure confidentiality, storing the data securely in a password-controlled server. The benefits of your participation are providing educational research with valuable insights into the dynamics of teachers´ teaching beliefs. Your participation will also help educational institutions support teachers to grow professionally by enhancing their teaching practices.

What will happen to the results of this research?

The results of this research will form the basis of an Oxford doctoral dissertation. Some results may be published in academic journals concerned with teachers´ beliefs, educational change, or teacher education. If you wish to obtain a copy of the published results, please inform the researcher. The study will take place over two academic years after which time the published results will be publicly available.

Who is organizing the research?

The research was granted a Judge Scholarship by the Department of Education, University of Oxford, and is organised as an independent doctoral research project in conjunction with it.

Contact for Further Information or Follow-up

Should you have any further questions about this research, please feel free to contact Oscar Urmeneta (oscar.urmeneta@education.ox.ac.uk) or Nigel Fancourt (nigel.fancourt@education.ox.ac.uk). Your inquiries are most welcome. If you remain unhappy or wish to make a formal complaint, please contact the Chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter as soon as possible (ethics@socsci.ox.ac.uk).