

Driving educational change at school federation level: A case study of team-based learning

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ABSTRACT

This case study is the response to an institutional need. It explores the suitability of promoting a university teaching method called Team-Based Learning as the key driver for educational change in the sixth-form of a Spanish school federation seeking to move towards active learning. Yet, the transformation of classroom teaching practices has been widely ignored by the field of educational change or, at best, considered to be the result, rather than the driver, of a dramatic shift in pedagogic culture. One that has proven elusive in large-scale, and mostly unsuccessful public policies of school reform, which underestimate the capacity of local settings to initiate and deliver change. This study reverses this top-down strategy, aligning with, and complementing, recent bottom-up approaches which, while devising conceptual frameworks to promote small-scale initiatives for educational change, fail to provide educators with operational teaching methods; it contends that Team-Based Learning might be one of them.

Drawing on the field of educational change, the Team-Based Learning framework, and organisational development theory, the study involves 18 teachers of 9 subjects, from 12 state-sponsored schools under the umbrella of the federation, in a one-year inter-school intervention that impacts on more than 500 sixth formers across Spain. The empirical research, focused on the sixth-form teachers' perspective, develops a triangulation method to analyse data gathered from a mixed-method approach that encompasses a bespoke questionnaire, an online forum, 6 interviews, and collaborative visual charts.

The research argues that promoting Team-Based Learning across the federation is a suitable, worthwhile strategy to drive educational change. In highlighting the centrality of teachers' attitudes towards innovative pedagogies and the crucial role played by the 16% of staff members proactive about change, it focuses on exploring the extent to which sixth-form innovators' stance on TBL is favourable. The findings are encouraging: those expected to lead the change find TBL dramatically transformative, would like to adopt it, and are willing to collaborate in its dissemination, considering it to be feasible with the appropriate institutional support.

The study further develops the Team-Based Learning framework by addressing several gaps in research and might be helpful for other multi-site institutions seeking educational change. It has enhanced the organisational development of the school federation by encouraging the adoption of autonomous, research-based policies and has greatly reinforced my leadership role by creating a thriving, transformative community of practice.

TABLE OF CONTENTS

List of figures and tables	5
1. INTRODUCTION: seeking change in pedagogic culture	6
1.1 Institutional priority: from traditional didactic lecturing towards active learning	6
1.2 Team-Based Learning: a promising pedagogy	7
1.3 The research problem: piloting TBL at school federation level	7
2 LITERATURE REVIEW	8
2.1 Structure, review questions and initial overview	8
2.2 Contributions from the field of educational change	9
2.2.1 Literature search strategy and main findings	9
2.2.2 Striving for educational change at school federation level is worthwhile	9
2.2.3 Pedagogy is key in educational change but remains underresearched	10
2.2.4 Educational change requires teachers' commitment and supportive climates	13
2.2.5 Summary	14
2.3 Analysis of the TBL framework	14
2.3.1 Literature search strategy and main findings	14
2.3.2 TBL has the makings of a driver for educational change	15
2.3.3 Piloting TBL poses multiple challenges	16
2.3.4 Summary	22
2.4 The organisational strategy to pilot TBL as a driver for active learning	22
2.4.1 Literature search strategy and main findings	22
2.4.2 University of Michigan: the failure of imposition	22
2.4.3 University of South Alabama: a sound strategy	23
2.4.4 The limitations of Distributed leadership	25
2.4.5 The necessity for face-to-face training and an online community of practice	26
2.4.6 Summary	27
2.5 Conclusions	27
3. RESEARCH DESIGN	29
3.1 Teachers' perspective and research questions	29
3.2 Inter-school intervention	29
3.2.1 Stage 1: adopting a leadership approach	30
3.2.2 Stage 2: recruiting participants	30
3.2.3 Stage 3: facilitating a 2-day face-to-face TBL workshop	31
3.2.4 Stage 4: mentoring a virtual community of practice	32
3.2.5 Stage 5: leading a final community-building event	34
3.3 Methodology: a single case study	34
3.4 Methods	37
3.4.1 A mixed-method approach	37
3.4.2 Online forum and interviews	38
3.4.3 A bespoke questionnaire	39
3.4.4 Collaborative visual charts	40
3.5 Ethics	40
4. RESEARCH FINDINGS	43
4.1 Data analysis approach: triangulation and graphic display	43
4.2 Participants consider TBL to be deeply transformative	45
4.2.1 TBL represents a dramatic shift	45
4.2.2 TBL has the makings of a driver for EC	46
4.3 Participants are quite willing, albeit still not sufficiently able, to adopt TBL	47
4.3.1 Teachers would like to adopt TBL	48
4.3.2 Aspects impacting participants' willingness	49
4.5 For participants, disseminating TBL is quite feasible with institutional support	50
4.5.1 optimism	51
4.5.2 Reasons for optimism	52
4.6 Participants consider a blended professional development programme to be suitable	53
4.6.1 Unanimity about the appropriateness of the organisational arrangements	53
4.6.2 Some small improvements	55
4.7 Summary	56
5. LIMITATIONS, CONCLUSION, AND DISCUSSION	57
5.1 Limitations and conclusion	57
5.2 Discussion	59
5.2.1 The position within the field of educational change	59
5.2.2 The contributions to the TBL framework	60
5.2.3 Professional and institutional implications	61
6. REFERENCE LIST	62
7. APPENDICES	73
Appendix 1: distribution of participants throughout Spain	73
Appendix 2: participant evaluation of the face-to-face workshop	74
Appendix 3: example of term report shared with participants on the online forum	75
Appendix 4: interview questions	78
Appendix 5: sample of expert contribution to content validation of a prospective questionnaire	79
Appendix 6: initial battery of items for a bespoke questionnaire	83
Appendix 7: bespoke questionnaire for this case study	86
Appendix 8: visual charts	89
Appendix 9: ethical approval	91
Appendix 10: consent letters	92

List of figures and tables

LIST OF FIGURES (406 words)

Figure 1: structure of the online termly forum

Figure 2: stages of the institutional project

Figure 3: exploratory and single-case study

Figure 4: teachers' action research cycle

Figure 5: teachers' action research spiral

Figure 6: methods used for data collection

Figure 7: triangulation method

Figure 8: result of the questionnaire subscale 1 on the transformative potential of TBL

Figure 9: result of the questionnaire subscale 2 on participants' willingness to adopt TBL

Figure 10: result of the questionnaire subscale 3 on the feasibility of TBL dissemination

Figure 11: result of the questionnaire subscale 4 on the professional development programme

LIST OF TABLES

Table 1: number of teachers per subject

Table 2: number of TBL units per term

Table 3: number of TBL units per teacher

Table 4: codification of the participants' experience of change

Table 5: distribution of number of participants answering the subscale 1 items

Table 6: codification of the participants' comments on their willingness to adopt TBL

Table 7: distribution of number of participants answering the subscale 2 items

Table 8: codification of the participants' stance on the feasibility of TBL dissemination

Table 9: distribution of number of participants answering the subscale 3 items

Table 10: codification of the participants' opinion about the professional development programme

Table 11: distribution of number of participants answering the subscale 4 items

1. INTRODUCTION: SEEKING CHANGE IN PEDAGOGIC CULTURE

1.1 Institutional priority: from traditional didactic lecturing towards active learning

I am lucky to have different teaching experiences within a catholic federation that brings 21 state-sponsored schools throughout Spain together, with 1,500 teachers in total. I have been teaching philosophy in the sixth form for years, serving two consecutive terms as the headteacher of my particular school. Four years ago, I went on to join the Federation Steering Committee as the Academic Excellence Coordinator with a major responsibility: taking the initiative to develop and implement an effective strategy to move from traditional didactic lecturing towards active learning. Our teacher-centred pedagogy, focused on delivering theory to help students pass exams by reproducing content, did not appear to respond to their actual needs anymore; it was at odds with the competence-led approach recommended by the Organisation for Economic and Cultural Development (OECD) in the light of the Programme for International Student Assessment (PISA) (OECD, 2005) which Spanish education reforms had systematically failed to ‘deepen and consolidate’ (Monarca & Rappoport, 2013, p. 55), thus making it necessary for us to find our way forward.

However, the adoption of a competence-led culture, a challenging task in itself (e.g., Kimonen & Nevalainen, 2005), seems particularly difficult in the Spanish sixth form, where the necessity for high academic performance in the content-led *Evaluación para el Acceso a la Universidad* (EvAU), Spanish equivalent of A-level exams, is central. Yet, we are not content with sixth formers excelling in the EvAU anymore; we would also like them to turn from passive receptors to builders of their own learning processes. To address this challenge, I suggested embarking on a project that reverses the usual top-down approach: using an operational teaching practice as the key driver for a change in pedagogic culture, rather than vice versa. Giving sixth-form teachers the opportunity to experience the advantages of Team-Based Learning, a teaching strategy that provides a structured sequence of activities that delivers active learning and improves students’ learning outcomes (e.g., Haidet et al., 2014), might lead them to change their beliefs and practices. This teaching method’s origin in higher education might also play an authoritative role for those resisting change on the basis that active, non-content-focused approaches are unsuitable for university-preparatory stages like the Spanish sixth form.

1.2 Team-Based Learning: a promising pedagogy

Virtually unknown in Europe, where there is just a budding community of practitioners (TBLC, 2018), Team-Based Learning (TBL) is an American university teaching method created to deliver active learning in business classes that were becoming overly large (e.g., Michaelsen, 2002). In terms of design, it requires that teachers prepare units backwards (Michaelsen & Sweet, 2008c) by starting with what they want students to be able to do and finishing with the selection of contents. In terms of classroom dynamics, it delivers materials with the fundamental concepts in advance, and devotes classroom time almost exclusively to having students learn by doing (Sibley & Ostafichuk, 2014). At the beginning of every TBL unit, students face a readiness assurance process that makes them come to class prepared: an individual multiple-choice test addressing content at the level of remembering and understanding that is immediately retaken in stable teams made up of 5-7 members. The rest of the classroom time is entirely devoted to undertaking structured, significant and close-ended team activities aimed at helping students apply the theory to real problems, stimulating their progress towards the highest levels of the cognitive hierarchy. Teams are required to make a shared decision and report it simultaneously, provoking subsequent between-team discussion and justification. At the end of every term, team members conduct peer evaluation to finetune the final team mark of each student according to their actual contribution. In terms of facilitation, the teacher is a guide who provides immediate feedback on both the team test and the application activities, expanding on those aspects that require further clarification.

1.3 The research problem: piloting TBL at school federation level

The first step of the above-mentioned project was to adopt TBL in my upper-sixth-form philosophy classes for a whole academic year, which I described in my Part 2 assignment. This intervention dramatically changed my beliefs about teaching and learning, pointing to the suitability of piloting it at institutional level. This study is the second step and explores how 18 sixth-form teachers of 9 different subjects, from 12 schools of the federation, pilot TBL, addressing the following research problem: **to what extent is the institutional promotion of TBL a suitable strategy to drive change in the sixth-form pedagogic culture of the school federation?** The next section reviews the literature to justify its relevance and, if appropriate, to inform a prospective empirical study designed to address it.

2 LITERATURE REVIEW

2.1 Structure, review questions and initial overview

The research problem has two premises: a) a school federation has the capacity to drive dramatic change, and b) this change can be driven through the implementation of a teaching method. It also entails an organisational challenge, requiring the development of an inter-school strategy. As the strategic planning, management and 'diffusion of change' is the 'calculative science' of 'educational change' (EC) (Hargreaves, 2000, p. 2), it appears reasonable to review the literature by distinguishing three parts.

Subsection 2.2 explores the contributions from the field of EC, addressing these questions:

- a) how realistic, if at all, is it for a school federation to strive to drive EC?
- b) how far can EC be driven through a teaching method, if possible?
- c) how could this teaching method, if at all, be institutionally promoted?

Subsection 2.3 turns to the TBL framework to answer these questions:

- d) to what extent can TBL be one of these teaching methods?
- e) what would the challenges in piloting TBL in the federation's sixth-form be?

Subsection 2.4 reassesses the field of EC and the TBL framework to address this question:

- f) what would the best institutional strategy for this piloting process be?

Subsection 2.2 shows that driving EC at federation level by adopting active pedagogies, while virtually unexplored, is not futile; it is consistent with recent approaches which emphasise that EC ultimately depends on the educators' lived experience when facing innovation and requires the promotion of supportive institutional environments.

Subsection 2.3 suggests that piloting TBL as a driver for EC in the federation's sixth form is a worthwhile, albeit challenging, task. TBL is highly consistent with the principles of the above-mentioned pedagogies that might deliver EC, but the task is fraught with uncertainty; it enters unexplored territory, addressing a field for the development of the TBL framework.

Subsection 2.4 concludes that the institutional strategy needed to pilot TBL in a decentralised school federation requires an inter-school, teacher professional development programme led by a knowledgeable TBL practitioner. One that provides innovators with initial experiential training and, afterwards, ongoing mentoring through a virtual community of practice.

2.2 Contributions from the field of educational change

2.2.1 LITERATURE SEARCH STRATEGY AND MAIN FINDINGS

EC denotes a body of knowledge 'so extensive... that it has virtually come to constitute a field of study in its own right' (Hargreaves et al., 1998, p. 4). One that has 'a scholarly journal, and a definitive research handbook' (Waks, 2007, p. 277): the *Journal of Educational Change* and the edited *International Handbook of Educational Change* (Hargreaves et al., 1998). The former has published around 500 conceptual and empirical articles. I addressed them through the lens of *Evolution in educational change: A literature review of the historical core of the Journal of Educational Change* (Garcia-Huidobro, 2017), which analyses the 52 most relevant papers. This review, in turn, highlights the importance of two 'canonical works' (p. 280): *The New Meaning of Educational Change* (Fullan, 2015) and *The Fourth Way: The inspiring future for educational change* (Hargreaves & Shirley, 2009). This collection of articles and reference books might suffice to understand the contributions from the field regarding the review questions. The main findings suggest that:

- a) striving to drive EC at federation level, albeit an unusual strategy, is worthwhile;
- b) adopting active and engaging classroom practices is the crux of successful EC; and
- c) educators' commitment to innovative teaching practices requires professional development programmes within supportive cultures of collaboration.

2.2.2 STRIVING FOR EDUCATIONAL CHANGE AT SCHOOL FEDERATION LEVEL IS WORTHWHILE

The level at which EC must be driven has not been a central issue. The predominant approach contends that it is the result of system-wide policies seeking school reform (Hargreaves et al., 1998; OECD, 2010; Sahlberg, 2011, 2015; Waks, 2007), even when addressing local contexts such as schools or districts (MacBeath, 2006; Pyhältö et al., 2012, 2014; Thuneberg et al., 2014) or calling for the necessity to 'support schools in building the internal capacity for change' (Harris, 2003, p. 369). This is despite the general agreement that these efforts have historically produced disappointing results (Cuban, 2013; Fullan, 2015; Hargreaves & Shirley,

2009; Levin, 2008; Payne, 2008; Whelan, 2013). Leithwood et al. (2002) epitomise this stance implying that, although large-scale reform efforts usually fail, smaller-scale projects for change are futile; local and non-official initiatives are unlikely to be tolerated by those who do and should “call the shots” (p. 28). Nevertheless, they fail to provide evidence of the incapability of local institutions to overcome this systemic barrier. This might apply to Spain; while official policies are shown to be failing at generating the desired effects’ (Monarca & Rappoport, 2013, p. 55), and ‘[state] school organization’ contributes to ‘the inertia of the status quo’ (San Fabián, 2011, p. 41), the literature provides no evidence of the incapability of non-state institutions, such as a catholic federation, to drive EC.

Within this framework, only few authors have contended that local contexts are the genuine promoters of change (Sachs, 2000; Fielding, 2001; Oakes & Lipton, 2002). Nonetheless, this minority position is consistent with recent perspectives in the field. While sharing with Leithwood et al. (2002) a preference for system-wide reforms, they emphasise the centrality of local initiatives as facilitators and even promoters of successful transformation. Hargreaves & Shirley (2009) report experiences in districts and school networks that ‘demonstrate how positive change does not always begin with government but must sometimes work aside and even in opposition to it’ and ‘give clues about the most desirable way forward’ (p. 7). Fullan (2015) contends that some district-wide reform efforts have proved to be effective. What is more, case studies exploring the promotion of change in school networks suggest that successful EC depends on how innovations are implemented, rather than on the scale of the institution. Nonetheless, these successful experiences initiated at local settings are still scant and under development, requiring more time and further empirical study. They also come from the Anglosphere, and ‘contextual factors’ (Garcia-Huidobro et al., 2017, p. 273) may limit their transferability to Spain.

Thus, given the disappointing results of large-scale efforts and the lack of definitive evidence against smaller-scale initiatives, the above-mentioned experiences suggest that promoting change at school federation level is worth exploring.

2.2.3 PEDAGOGY IS KEY IN EDUCATIONAL CHANGE BUT REMAINS UNDERRESEARCHED

Teaching strategies have been largely ignored in the field of EC (Garcia-Huidobro et al., 2017; Leithwood et al., 2002). However, some scholars consider pedagogy to be a crucial aspect for school transformation both

globally (Rincón-Gallardo & Elmore, 2012; Cuban, 2013; Fullan, 2015; Harris, 2003; Hargreaves & Shirley, 2009; Owston, 2007; OECD, 2005; Schleicher, 2007) and in Spain (e.g., Bolívar & Moreno, 2006), where there is 'a considerable gap between what regulations seek to do and what is really happening in the classroom' (Monarca & Rappoport, 2013, p. 55). They emphasise that 'failing to transform the teaching practices' (Bolívar & Moreno, 2006, p. 2) underlies the failure of large-scale initiatives in several ways: a) by focusing on 'modifications that are only weakly related—if at all—to the “instructional core”' (Rincón-Gallardo & Elmore, 2012, p. 476); b) by not entering 'the black box of classroom practice' making mere 'change without reform' (Cuban, 2013, p. 6); c) by adopting innovations 'on the surface, with some of the language and structures becoming altered, but not the practice of teaching' (Fullan, 2015, p. 6); d) by not locating 'improvement efforts closer to the classroom' (Harris, 2003, p. 369); and e) by forgetting that 'mindful learning and teaching' is 'a central education strategy' for successful EC (Hargreaves & Shirley, 2009, p. 58). This criticism is also consistent with PISA (e.g., OECD, 2005), which emphasises the centrality of pedagogic innovations (Owston, 2007), and recommends the adoption of a competence-led approach to teaching practice (Schleicher, 2007).

Nonetheless, these scholars still remain outside the classroom, building some conceptual frameworks but failing to address what teachers and students should actually do to deliver change. Hargreaves et al. (1998) include the terms 'cooperative learning', '"constructivist"-inspired forms of teaching and learning', and 'teaching for understanding' among a list of changes encountered by teachers in their practice (p. 2), but none of the four sections of their 'definitive research handbook' (Waks, 2007, p. 277) focuses on pedagogy as a driver for EC. To overcome this shortcoming, Hargreaves & Shirley (2009) include pedagogy as one of the 'six pillars' in their *Fourth Way* of driving reform, and propose 'personalised learning', a 'Jesuit pedagogy' (p. 59) that a) includes the 21st-century skills, b) makes learning more significant for students, and c) 'transforms the learning process into something deeper, more challenging, and more connected to compelling issues in their world and their lives' (p. 59). More recently, within a framework of 'new pedagogies for deep learning' (Fullan & Langworthy, 2013, p. 1) which are in line with the 21st century skills, Fullan (2015) considers pedagogy to be one of the 'right drivers' for EC (p. 42). He proposes a 'student-centred' approach that 'has the makings of a learning revolution' (p. 156): a) being 'irresistibly engaging' to overcome students' boredom with the traditional pedagogy that considers them 'passive recipients' of

knowledge (p. 139); b) enabling them to achieve deep understanding by having them apply knowledge critically to new situations; and c) being significant enough to help them cope with real life. All these efforts, while relevant, fail to provide teachers with operational strategies, are still under development, and require more accurate conceptualisation and further empirical studies.

Harris (2011) attempted to go further and know what the theoretical 'Fourth Way educational change look[s] like in practice' (p. 166), analysing its implementation in a reform process undertaken in Wales. However, she focused on the development of professional learning communities rather than on what students and teachers really do to transform learning. PISA emphasises the 'key competences' (OECD, 2005, p. 3), highlighting the necessity for making a shift from pedagogies focused on preparing students to reproduce content towards competence-led approaches that prioritise the application of content 'in novel situations' (Schleicher, 2007, p. 349). However, it focuses on system-wide policies seeking large-scale reforms, failing to address operational classroom teaching practices. Even Leithwood et al. (2002) , who highlight the centrality of classroom practice, fail to specify what the 'manageable classroom practices' (p.27) presumably available to drive change are.

Only Harris (2003) appears to succeed in going 'behind the classroom door' (p. 369) with her comparative analysis of three case studies that address successful pedagogic change at classroom level. Her analysis yielded four shared features: a) the importance of defining specific rather than general student learning outcomes; b) the centrality of providing teachers with 'clear instructional frameworks' (p. 376), describing what to do in the classroom to help students achieve those learning goals; c) the adoption of constructivist approaches; and d) the prioritisation of co-operative learning.

Accordingly, pedagogy appears to be crucial in successful school reform but has been virtually ignored as a driver for EC. Some scholars have sketched out student-centred and constructivist frameworks, showing a way forward. However, there is very little empirical analysis and no instructional strategies to make them operational.

2.2.4 EDUCATIONAL CHANGE REQUIRES TEACHERS' COMMITMENT AND SUPPORTIVE CLIMATES

When focusing on the classroom, teachers emerge as the key change drivers, pointing to the centrality of developing appropriate institutional environments. EC initiatives using top-down styles of leadership have been challenged by many scholars (Pyhältö et al., 2012; Barber & Mourshed, 2007; Daly & Finnigan, 2010) for 'disempower[ing] rather than empower[ing] teachers' (MacBeath, 2006, p. 44), who 'see themselves as objects of reforms rather than as active participants' (Pyhältö et al., 2012, p. 110). Criticisms of externally imposed innovation informs debates concerning the organizational arrangements required for successful EC, which revolves around both teachers' preparation for and emotional reaction to innovation.

Much literature highlighted the centrality of professional development (Garcia-Huidobro et al., 2017; Hargreaves & Shirley, 2009) against the ineffectiveness of 'external accountability' (Fullan, 2015, p. 231) and 'top-down control' (Chow et al., 2011, p. 12; also Pyhältö et al., 2011). Indeed, studies in the wake of PISA consider professional agency as a key driver for successful EC in high-performing education systems (Pyhältö et al., 2012, 2014; Schleicher, 2007), but which requires favourable teaching contexts that meet two conditions: a 'supportive professional climate' that, free from the pressure of external control, promotes rather than penalises risk-taking approaches in the classroom (Sahlberg, 2006, p. 284); and a non-managerial and capacity-developing approach to teacher training which responds to educators' actual needs in the classroom (King & Stevenson, 2017). This is entirely consistent with the Spanish context, where 'secondary teachers have resisted educational change' because of a top-down imposition of 'teacher training' (Bolívar & Moreno, 2006, p. 2). This emotional resistance to change has also been addressed by literature, albeit with less emphasis (eg. Lee & Yin, 2011). Empirical studies, mainly qualitative, show that 'the crux of change is how individuals come to grips with' it (Fullan, 2015, p. 18) because subjective sentiments and personal experience when facing uncertainty ultimately determine teachers' commitment to change (Louis, 2007), turning them into obstacles or facilitators (Goodson, 2001; Troman & Woods, 2000).

When exploring effective ways to create the conditions for innovative environments, research drawing on PISA (Sahlberg, 2006) and on case studies of successful schools (Fullan, 2015; Hargreaves & Fullan, 2012) points to avoiding teacher isolation by building supportive cultures of participation and collaboration within,

and between, schools. Frameworks such as 'professional learning communities' (Harris, 2011, p. 4; also Hipp et al., 2008; Stoll, 1996) and 'distributed leadership' (Harris & DeFlaminis, 2016, p. 141; also Harris et al., 2007) might suggest suitable organisational arrangements to pilot TBL as a driver for EC.

Accordingly, EC requires institutional strategies that promote teachers' positive experiences in the face of innovation through professional growth within supportive and collaborative environments.

2.2.5 SUMMARY

A preliminary approach to the field of EC justifies the assumptions of the research problem, suggesting the following conclusions.

- a) Striving to transform the pedagogic culture at school federation level makes sense; in contrast to the usual failures of large-scale reforms, research into budding, smaller-scale efforts point to local initiatives as a way forward.
- b) Engaging and student-centred practices are essential to drive such transformation but have been largely ignored by scholars, who at best provide conceptual frameworks rather than operational pedagogies.
- c) Promoting professional development within supportive institutional environments is crucial; teachers are the key change agents, and their commitment depends on their experience when managing transformative pedagogies.

Subsection 2.3 explores the degree to which TBL can be considered one of these pedagogies and identifies possible challenges in piloting it as a driver for EC in the federation's sixth form.

2.3 Analysis of the TBL framework

2.3.1 LITERATURE SEARCH STRATEGY AND MAIN FINDINGS

The literature on TBL appears less developed and consistent than that on EC; there is no single cross reference between the four systematic literature reviews conducted to date (Fatmi et al., 2013; Haidet et al., 2014; Reimschisel et al., 2017; Sisk, 2011), although two of them (Fatmi et al., 2013; Reimschisel et al., 2017) focus on health sciences and were published by the same journal. To ensure a comprehensive review,

I collected academic and empirical studies by a) working on the above-mentioned four literature reviews and their references, and b) searching for recent publications with the phrase “Team-Based Learning” OR “TBL” on Scopus. I also gathered experience-based literature by consulting reference books (Sibley & Ostafichuk, 2014; Sweet & Michaelsen, 2012) and their references. To avoid digression, I determined the relevance of these sources against the research problem. Finally, to avoid possible omissions when the literature was scarce, I contacted senior leaders of TBL, including its inventor.

The findings suggest that addressing the research problem is worthwhile; TBL delivers a dramatic shift and is consistent with the conceptual frameworks devised in the field of EC. However, it is also fraught with uncertainty due to several factors:

- a) absence of evidence about the suitability of TBL in some disciplines;
- b) lack of conclusive evidence that TBL is suitable in the sixth form;
- c) lack of standardised teacher development to ensure fidelity of, and success in, implementation;
- d) scant research into the educators’ experiences with TBL and limitations of the methods for measuring it; and
- e) virtual absence of experiences using TBL beyond classroom level as the cornerstone of institutional strategies.

2.3.2 TBL HAS THE MAKINGS OF A DRIVER FOR EDUCATIONAL CHANGE

My Part 2 assignment showed that TBL entails a dramatic transformation, resulting in a ‘paradigm shift’ (Sibley & Parmelee, 2008, p. 47; also Frame et al., 2015; Haidet et al., 2014; Hunter & Robinson, 2012;) which challenges teachers’ ‘beliefs about teaching’ (Sibley & Ostafichuk, 2014, p. 4). All four TBL literature reviews (Fatmi et al., 2013; Haidet et al., 2014; Reimschisel et al., 2017; Sisk, 2011), experience-based studies in multiple disciplines (Chung et al. 2009; Conway et al. 2010; Huggins & Stamatel, 2015; Hunter & Robinson, 2012; Janssen et al., 2008; LeFebvre, 2016; Mahler, 2012), and senior practitioners (Freeman, 2002; Hawkins, 2014) agree that, far from remaining on the surface, TBL completely transforms the role of teachers and students within the learning process.

Moreover, literature provides a strong body of empirical and conceptual evidence suggesting a remarkable consistency between TBL and the transformative frameworks devised in the field of EC. TBL adopts a student-centred and competence-led approach, focuses on the application of content to real-life situations, is highly engaging for students, and turns them into active agents in the learning process, making it deeper and more significant (Fatmi et al., 2013; Haidet et al., 2014; Lane, 2008; Michaelsen & Sweet, 2011; Parmelee & Michaelsen, 2010; Sibley & Ostafichuk, 2014; Sisk, 2011). What is more, TBL also meets the four features of successful EC highlighted in Harris' (2003) empirical study: a) it makes teachers think backwards, prioritising the definition of concrete student learning outcomes (Janotha, 2015; Jarjoura et al., 2015; Parmelee et al., 2012; Parmelee & Michaelsen, 2010); it provides a clear and structured sequence of teaching actions (Michaelsen & Sweet, 2008b; Sibley & Ostafichuk, 2014); c) it adopts a constructivist approach (Hrynchak & Batty, 2012; Kubitz, 2014; Wanzek, Vaughn, et al., 2014); and d) it delivers co-operative learning (Borges et al., 2012; Chang et al., 2015; Chung et al., 2009; Huggins & Stamatel, 2015; Hunter & Robinson, 2012; Kubitz & Lightner, 2012).

Thus, a comparative literature review shows a remarkable consistency between the transformative frameworks devised in the field of EC, and the very nature of TBL, suggesting its suitability as a driver for EC.

2.3.3 PILOTING TBL POSES MULTIPLE CHALLENGES

Piloting TBL as a driver for EC in the sixth form, while seemingly worthwhile, is fraught with difficulties. This subsection explores five of them, concluding that it might contribute something positive to the further development of TBL.

2.3.3.1 The concentration in some disciplines

The implementation of TBL has been uneven, and evidence about its suitability in some disciplines is scant; initially developed in business faculties, much growth has concentrated on the health sciences (Reimschisel et al., 2017). A review of the publications since 2016 confirms this predominance, showing a growing interest from the realms of science, technology, engineering, and mathematics (STEM). From among the 147 papers published about TBL as a teaching method, over 100 concerned medicine (e.g., Burgess et al., 2016), pharmacy (e.g., Tweddell et al., 2016), or nursery (e.g., Morris, 2016), and 20 papers concerned STEM

(e.g., Najdanovic-Visak, 2017). Only 16 studies addressed other realms: business disciplines (e.g., Huang & Lin, 2017), education (e.g., Espey, 2018), psychology (e.g., Rania et al., 2017), leadership (e.g., Estis, 2017), sociology (e.g., Stein et al., 2016), and communication (LeFebvre, 2016). Experiences with TBL in literature, English, history, philosophy, and drama (Sweet & Michaelsen, 2012; Van Orman, 2015), albeit encouraging, are still scant and isolated. This dearth of evidence concerning the social sciences and humanities results in uncertainty; a sixth-form-wide initiative would therefore cover subjects unusual for TBL practitioners.

2.3.3.2 The focus on higher education

My Part 2 assignment showed that there is little guidance for any initiative to implement TBL within secondary schooling; the few existent papers on pre-university TBL address pilot projects without replication rather than a systematic adoption of TBL. Five of them (Chan, 2016; Vaughn et al., 2013, 2014; Wanzek, Swanson, et al., 2014; Jarjoura et al., 2015) do not explore the implementation of genuine TBL, but adaptations that combine several innovative strategies or work in tandem with traditional lecturing. Another paper (Chang et al., 2015) does not provide empirical data, lacking precision in the description of the students' age and the training received by teachers. Only three studies (Kent et al., 2015; Wanzek et al., 2015; Wanzek, Vaughn, et al., 2014) explore authentic TBL, providing empirical data about trials in history classes. Focusing on students' learning outcomes, they imply the possible existence of an age factor, which is consistent with the emphasis on the capacity of TBL to promote higher-level learning and critical thinking (Michaelsen & Sweet, 2008a); TBL yielded positive results in 11 grade students but was inefficient with 8 grade pupils.

Accordingly, there is no conclusive evidence of either the suitability or the unsuitability of TBL before university; the very scant research into it only concerns trials and requires replication.

2.3.3.3 The lack of clear teacher development standards

A collection of cross-disciplinary, experience-based evidence shows that the above-mentioned shift in paradigm requires strong commitment from teachers (Freeman, 2012), who need to develop 'new skill sets' (Tweddell et al., 2016, p. 7) and change their 'beliefs about teaching' (Sibley & Ostafichuk, 2014, p. 4) to completely transform the course design (Roberson & Franchini, 2014) and deliver a different learning

experience (Drummond, 2012; Hrynychak & Batty, 2012; Jarjoura et al., 2015; Lane, 2008; Mahler, 2012; Stamatel et al., 2013). Arguably, this transformative character of TBL requires 'a steep learning curve' (Nelson & Tweddell, 2017, p. 103) which is difficult to achieve (Wanzek et al., 2015). However, while there is a 'two-year development program' to accredit 'trainers and mentors' able to support 'others in implementing TBL' (TBLC, 2018), the absence of a clear teacher training standard to ensure successful and reliable implementation (Tweddell, 2018) constitutes a relevant issue; senior TBL practitioners are increasingly concerned about the necessity for developing appropriate evaluation tools for the actual implementation of TBL in the classroom (Milman, 2017).

Wanzek, Vaughn, et al. (2014) claimed to be the first to create a procedure to evaluate fidelity to TBL, relying on observation. However, this procedure has some limitations for this study. In terms of approach, it only focuses on implementation, whereas failure to ensure an appropriate design can be devastating (Sibley & Ostafichuk, 2014); newcomers to TBL experience their very first difficulties when designing units, (Roberson & Franchini, 2014), which determines their subsequent attitude towards TBL. In terms of method, external observation can hardly evaluate the teachers' subjective experience either in the implementation of TBL or in the design of TBL modules.

Thus, the lack of clear professional development standards, an aspect crucial for successful EC, creates uncertainty regarding the suitability of the training provided to educators. It also hampers reliable conclusions; unsatisfactory results might derive from deficient training rather than from the unsuitability of TBL.

2.3.3.4 Ignoring the educators' perspective

Despite the strong commitment required from TBL adopters, research focuses on student learning outcomes, and, when addressing perception, debates revolve around the students' perspective. Only very recently, four studies (Kebodeaux et al. 2017; Nelson & Tweddell., 2017; Tweddell et al., 2016; Freeman, 2012) have focused on educators' perceptions.

The first three papers agree that TBL significantly increases the pre-class workload but is more enjoyable than traditional lecturing, paying off over time. Nelson & Tweddell (2017) and Tweddell et al. (2016) specify that this workload increase occurs in terms of preparation of materials and professional development and agree that designing application activities is the most difficult aspect of TBL. Tweddell et al. (2016) report that teachers struggle to adopt the new role of facilitators, and Nelson & Tweddell (2017) highlight three relevant findings: a) prospective TBL adopters should initially experience TBL as a student in order to fully understand it; b) there can be some incompatibility between TBL and systemic or institutional policies such as a grade system that considers only standardised examinations, without room for graded application activities; and c) some students who experience TBL as their only practice may 'become burned out on TBL' (p.110) and others with different learning styles can be harmed. Nonetheless, these studies are limited for several reasons: the small sample, the necessity for replication, and the methods used. Nelson & Tweddell (2017) and Tweddell et al. (2016) use semi-structured interviews to find relevant information, but they are already strongly committed to TBL and, possibly, biased. Kebodeaux et al. (2017) use a survey, but they neither justify the exclusion of qualitative data nor provide evidence that the survey is validated.

Freeman's (2012) study, while consistent with the above-mentioned papers, deserves separate attention; based on contributions from organisational development theory (Rogers, 2003; Frambach & Schillewaert, 2002), it is the only study that adopts a mixed-method approach, gathering data through 7 semi-structured interviews and an online survey completed by 44 international TBL practitioners. The data analysis adopts a complementary approach that uses interviews to clarify the survey results, showing the following findings: while TBL improves students' engagement and learning outcomes, practitioners consider that it takes an 'extra effort', entails 'uncertainty in their role as facilitators', is difficult to use in 'small classes', and requires facing some student resistance (p. 160); TBL is experienced by practitioners as a significant shift regarding institutional culture, being 'incompatible' (26%) or only 'moderately compatible' (52%) with it (p. 161); it is seen as a very different 'teaching style' that is challenging (65%) or very challenging (9%) for adopters, particularly when it comes to designing application activities and 'explaining it to students and colleagues' (p. 162); due to its complexity, 71% of practitioners consider that adopting TBL takes time, implying that an incremental trial before making the decision is more appropriate than adopting it in its entirety; finally,

practitioners emphasise the advantages of being trained in TBL by institutional leaders due to 'the influence of the academic leader as an innovation champion' (p. 164).

This study also has some limitations. In terms of method, it does not provide evidence of the validity of the survey and fails to justify both a preference for a mixed-method approach and the type of interview selected. In terms of data analysis, it fails to justify the superiority of the complementary perspective that prioritises a survey over qualitative data. In terms of approach, it has a bias towards innovators and requires replication. Nevertheless, Freeman's (2012) conclusions point to the organisational sphere, emphasising that disseminating TBL requires a) 'resources and tools to support TBL adopters', b) 'motivating other leaders distributed throughout' the organisation (p. 166), and c) making adopters' practices and outcomes visible for the rest of the teachers.

Accordingly, empirical data concerning teachers' experiences is very scant and gathered through non-validated and, sometimes, non-justified methods. This limitation is worth noting, given the centrality of educators' lived experiences in successful EC, and the existence of a validated questionnaire for students' experiences with TBL (Mennenga, 2012).

2.3.3.5 The virtual absence of implementation at institutional level

The institution-wide adoption of TBL has only been tangentially mentioned (Parmelee et al., 2012; Parmelee, 2014; Conway et al., 2010) and, according to its inventor, Larry Michaelsen – in a personal communication (Michaelsen 2018), only one case has been addressed in depth by the literature: the ongoing experience at the University of South Alabama. Styron et al. (2015) report 'the pilot and first year' of this initiative (p. 194), and Estis' (2017) more up-to-date account covers the first 4 years. It shows positive results in terms of learning outcomes and participants; starting with 11 volunteers, 'over 4 years, approximately 250 teachers have received in-depth training in TBL and each semester more than 80 teachers are using the approach in their courses' (Estis, 2017, p. 111). However, this experience has some limitations: a) it has not been conducted at pre-university level; b) it does not concern a multi-site institution; c) training and monitoring have been provided by senior TBL leaders (including the inventor himself), which maximises fidelity of implementation but is virtually unfeasible for my school federation; d)

it focuses on the students' performance and reduces the teachers' perspective to only their opinions about it, overlooking their experience with innovation, an aspect critical in EC (and in the sixth form where the suitability of TBL remains unexplored); and e) the pilot year is devoted to disseminating TBL rather than to exploring the suitability of its prospective dissemination. Moreover, this experience uses a satisfaction survey as the sole method of data gathering, which impacts on the shortcomings of the above-mentioned studies. Styron et al. (2015) pretended to have shown that 'it is possible to successfully bring about a culture change' through TBL (p. 209), but they actually show the impact of TBL on students' performance, rather than on the alteration of teachers' pedagogic beliefs. Estis (2017) contends that this initiative is a 'specific example' (p. 110) of a change in a culture driven by TBL, but 170 teachers of the 250 highly trained in TBL do not implement it, and there is no evidence that the 80 using it have definitely adopted it.

While not at institutional level, Remington et al. (2015) explore the implementation of TBL 'on a large scale', identifying some 'challenges distinct from those that accompany smaller scale adoption' (p. 121). They report how 28 teachers were obliged to unify their pedagogy by adopting TBL across a five-semester course for doctoral students at the University of Michigan College of Pharmacy and, drawing on the feedback of students and instructors, claim that the experience was successful 'overall' (p. 129). Some of the challenges posed by the scope of this study are particularly relevant: a) the educators' improvable buy-in, mainly due to an initial resistance to the increase in workload involved in designing TBL modules, the 'loss of individual freedom to choose a pedagogy' (p. 124), and insufficient institutional support and commitment to active learning in general, and to TBL in particular; b) the difficulty in developing the new skills required to design TBL modules, greater than expected; and c) the lack of 'consistency of execution' of, and fidelity to, TBL in the educators' implementation (p. 125). However, this study has serious limitations. In general terms, the inconsistency of the implementation among educators questions its alleged successful character. In terms of professional development, and in contrast to the above-mentioned experience at the University of South Alabama, professional development was led by two non-practitioner coordinators whose only experience was their participation in the 2011 TBL Annual Conference. In terms of method, two focus groups, aimed at identifying both the teachers' strengths in TBL implementation and the organisational changes necessary to improve it, might not have been the best tool to elicit educators' lived experiences of TBL and to evaluate the degree of success of large-scale implementation.

Thus, the implementation of TBL as an institutional catalyst for EC is very much in its infancy and virtually non-existent before university, meaning that we are entering unexplored territory.

2.3.4 SUMMARY

Subsection 2.2 showed that striving to transform the culture of a school federation through innovative pedagogies aligns with recent approaches in the field of EC and is worthwhile. However, it requires ensuring teachers' positive experience when tackling innovation by fostering supportive and capacity-building environments. Subsection 2.3 has shown that, while TBL meets the requirements of these pedagogies, any initiative to promote it institutionally before university requires an innovative pilot study full of uncertainties. But this is precisely why this study is worth undertaking; it addresses some gaps in research, contributing to the further development of the TBL framework. Subsection 2.4 will analyse the organisational arrangements required to successfully conduct it.

2.4 The organisational strategy to pilot TBL as a driver for active learning

2.4.1 LITERATURE SEARCH STRATEGY AND MAIN FINDINGS

This subsection reassesses the literature on both EC and TBL to find the strategy to best pilot TBL as a driver for EC in the sixth-form of a school federation. First, it evaluates the organisational arrangements of the experiences at the University of Michigan and at the University of South Alabama. Then, it assesses the two major contributions from the field of EC: distributed leadership and professional learning communities. The main findings show that piloting TBL should be offered to teachers as a professional development opportunity within a supportive programme that includes experiential training and ongoing online mentoring.

2.4.2 UNIVERSITY OF MICHIGAN: THE FAILURE OF IMPOSITION

The University of Michigan College of Pharmacy assumed that 'partial implementation of TBL... would impede student learning because student roles in these two pedagogical styles [traditional lecturing and TBL] are so different' (Remington et al., 2015, p. 125), opting to oblige educators to undertake its complete adoption instead. Two coordinators without previous experience with TBL were appointed to lead the

transition to TBL by assuming the following responsibilities: a) gain initial training by attending some workshops at the TBL Annual Conference; b) replicate them at the College; and c) monitor the process by providing individual feedback and promoting 'peer review and development of course materials' (Remington et al., 2015, p. 123). Additionally, educators were given two books on the theoretical principals of TBL and attended workshops on backward design delivered by the university's educational scientists.

However, the authors do not provide any evidence that incremental implementation of TBL hampers students' learning. What is more, rather than suggesting a successful way forward, this experience shows a good way to avoid failure. The explicit recognition of the resulting inconsistency of implementation 'across many faculty [sic], both within and across courses' (Remington et al., 2015, p. 125) points to a) the appropriateness of a gradual adoption of TBL, b) the centrality of knowledgeable experts leading the process, c) the counterproductive character of top-down impositions which are hardly experienced as genuine professional growth opportunities, and d) the necessity for a stronger institutional commitment to TBL.

2.4.3 UNIVERSITY OF SOUTH ALABAMA: A SOUND STRATEGY

Assuming that change in educational settings does not differ from organisational change at large, the University of South Alabama turned to organisational development theory (Kotter, 1996; Rogers, 2003; Litman, 2006), designing a bespoke strategy with 4 arrangements. The first arrangement was to impress upon teachers the necessity for change, emphasising the negative impact of traditional lecturing on learning outcomes, and the connection between insufficient involvement in the initiative and the risk of losing financial accreditation. The second arrangement was concerned with 'identifying and recruiting' the 16% of members of any organisation who are proactive about change, highly regarded by the rest, and determinant for the further dissemination of innovation to the 'majority' (Styron et al., 2015, p. 200, after Rogers, 2003). This approach yielded 11 participants in the pilot year, 60 in the second one, and 250 in the fourth one (Estis, 2017).

The third arrangement was to empower participants through a supportive, non-evaluative, 'environment whereby faculty could experience a sense of self-actualisation and professional growth' (Styron et al., 2015, p. 201) by meeting 4 requirements. Firstly, participation was voluntary. Secondly, professional development was promoted through high-quality training, including an introductory two-day summer workshop delivered by the inventor of TBL and additional workshops during the academic year. This training had participants experience TBL as students and conveyed the rationale and the importance of the initiative for them to become persuasive 'champions of TBL' (Estis, 2017, p. 111). Thirdly, systematic 'coaching' was provided informally 'through numerous one-on-one visits by the Project Director' (Styron et al., 2015, p. 202) and formally through the creation of 'Learning Walks': 'communities... of three to four instructors' who 'build a common understanding of practice' by collaboratively designing units and witnessing each other's practice (Styron et al., 2015, p. 202, after Guilott & Parker, 2012). Finally, the participants' effort was systematically acknowledged by publicly 'celebrating success' in formal events (Styron et al., 2015, p. 203).

The fourth arrangement was to maximise the visibility of the initiative through continuous communication about the benefits for students' performance, targeting not only teachers but the 'entire university community'. It included a) any kind of formal or informal meetings, b) 'monthly newsletters', c) 'daily e-mail announcements', and d) the use of 'a project website and Intranet' (Styron et al., 2015, p. 200).

These arrangements incorporate the contributions from organisational development theory, they are consistent with the field of EC apropos the centrality of professional development within supportive environments, and their rationale is similar to that of this study. Nonetheless, they have two practical limitations: a) rather than piloting TBL at an unusual stage, they aim to disseminate it at a stage where its suitability is already assumed; and b) using 'Learning Walks' (Styron et al., 2015, p. 202) is hardly feasible when participants are spread throughout Spain. The papers by Estis (2017) and Styron et al. (2015) also have some limitations. First, they specify neither how the institutions identify their early adopters nor the method used to recruit them voluntarily. Second, they do not provide evidence of success in the process of recruitment; there is no information about whether the participants in the pilot year amount to the crucial

16% of innovators. Finally, the description of the coaching process specifies neither the frequency of, nor the aspects included in, the feedback provided to teachers.

2.4.4 THE LIMITATIONS OF DISTRIBUTED LEADERSHIP

Distributed leadership (DL) is a controversial concept. Critics argue that it has 'become the preferred leadership concept' that 'can best be understood as a fashion or fad' (Lumby, 2016, p. 161). The two existing literature reviews (Bennett et al., 2003; Tian et al., 2016) agree that there is neither a clear definition of DL nor sufficient evidence of its positive impact; research 'has not yet reached a consensus on what distributed leadership is' (Tian et al., 2016, p. 152), and the evidence provided by empirical data 'must be judged to be indicative rather than conclusive' (Bennett et al., 2003, p. 53). Others, in contrast, contend that this lack of unanimity is due to 'misconception'; while further empirical research is needed, there is evidence that DL 'can be a force for positive organisational change' (Harris & DeFlaminis, 2016, p. 142). As exploring the actual strength of the evidence provided by empirical research could lead to digression, a practical strategy might be to analyse the most optimistic stance.

Harris & DeFlaminis (2016) try to overcome criticisms by elucidating what DL is and is not. It is neither simple 'delegation by another name', nor 'the notion that everyone leads', nor a particular 'model to follow..., some blueprint, some road map, or some definitive guide' (p. 143). Rather, DL is an organisational strategy promoting 'school transformation and improvement' by 'carefully shar[ing] responsibility and authority with those individuals who have the aptitude, ability and conviction to lead' (p. 144), which works 'only under the *right conditions*' (p. 143). The identification of these conditions seems very relevant for a federation which needs to entrust the delivery of its education project to headteachers distributed across the country. It would also be of great help in developing a strategy aimed at piloting TBL across the organisation. However, apart from the difficulty in making this concept operational, since 'any standardized prescription for distributed leadership should be avoided at all costs' (p. 144), DL, at best, takes a long-term approach which does not suit one-year projects. In fact, the only evidence of successful DL provided is 'a major, longitudinal research and development project' lasting 5 years (p. 142). In this respect, the identification of early adopters as the initial step of any change initiative, suggested by Rogers' (2003) organisational development theory, seems more helpful.

2.4.5 THE NECESSITY FOR FACE-TO-FACE TRAINING AND AN ONLINE COMMUNITY OF PRACTICE

The experience at the University of Michigan showed the centrality of building professional development strategies with actions ‘before, during, and after implementation of TBL’ (Remington et al., 2015, p. 127). This ongoing character, widely accepted by the literature on ‘teacher change’ (Clarke & Hollingsworth, 2002, p. 948), informed the arrangements at the University of South Alabama; besides ‘one-on-one visits’ by the project leader, coaching included small learning communities that foster reflection through ‘classroom visits to observe each other’s TBL teaching practice’ (Styron et al., 2015, p. 202). This strategy of building professional learning communities (PLCs) to foster ongoing teacher development was also highlighted in subsection 2.2.4 as one of the most effective strategies to drive EC, representing a meeting point between the TBL framework and the field of EC. Communities of practice (CoPs), a type of PLC (e.g., Steyn, 2017), are particularly suitable to help teachers pilot TBL. While ‘still an evolving concept’ (Li et al., 2009, p. 1), they are designed to promote novices’ professional growth through interaction and regular feedback from senior practitioners (Lave & Wenger, 1991), and can be used as a driver for institutional development (Wenger et al., 2002).

However, while feasible for institutions with one headquarters, PLCs appear unrealistic for a federation made up of schools scattered across Spain; while there is no universal definition (Stoll et al., 2006), PLCs are usually understood as being ‘within school’ communities led by ‘school principals’ (Schaap & de Bruijn, 2017, p. 109), rather than inter-school teams guided by a leader of a school federation. Therefore, building a virtual PLC (e.g., Wastiau, 2014) and, particularly, an online CoP (Liu, 2012; McLoughlin et al., 2018) is arguably a necessity rather than a choice. Yet, the debate about their effectiveness is divided. Some authors contend that ‘online communities achieve the goals of professional learning communities’ (Blitz, 2013, p. 1), and that empirical data suggests that ‘no significant difference exists between online and face-to-face’ professional development’ (Edinger, 2017, p. 301). Others, in contrast, emphasise the limitations: going online usually does not respond to the educators actual needs (Dede, 2006), develops unsatisfactory teacher commitment (Giles & Hargreaves, 2006), generates an insufficient sense of community (Liu, 2012), and tends not to take institutional development into consideration (Hargreaves & Fullan, 2012). These disadvantages are relevant to this study for several reasons: first, effective training in TBL requires participants’ ‘experiential learning’ (Nelson & Tweddell, 2017, p. 103), which is only possible face-to-face;

second, the dramatic shift involved with TBL requires educators' 'full commitment' (Freeman, 2012, p. 163); finally, its institutional promotion requires 'building collegiality' and developing a sense of community (Styron et al., 2015, p. 202).

Accordingly, the challenging nature of TBL and the decentralised character of the federation require the combination of an initial face-to-face workshop with an online CoP. The former would enable participants to a) learn the essential elements of TBL by experiencing it first as students, b) develop an incipient sense of community by meeting each other in person, and c) receive direct support from the Federations Direction Committee. The latter would provide them with ongoing personal mentoring and the opportunity to share their experiences, reinforcing the budding sense of community.

2.4.6 SUMMARY

Literature shows that piloting TBL as a driver for EC in the sixth form of a decentralised federation requires knowledgeable leaders who are able to involve innovators in a process experienced not as a top-down imposition, but as an opportunity to grow professionally within a supportive environment; one that provides initial face-to-face training and ongoing mentoring via an online community of practice.

2.5 Conclusions

This exploration has shown the suitability of addressing the research problem by answering the review questions as follows.

- a) Given the disappointing outcomes of system-wide efforts, initiatives of EC at the level of school federation, while unusual, might be a suitable way forward.
- b) Successful initiatives of EC require the transformation of classroom practices by adopting innovative pedagogies; scholars have failed to provide them but have devised a few conceptual frameworks pointing to engaging, constructivist, student-centred, and active approaches.
- c) Adopting transformative pedagogies requires supportive environments that empower teachers, the key actors of EC, with professional development to have a rewarding experience when facing uncertainty.

- d) TBL might be one of these transformative teaching strategies because it is highly consistent with the above-mentioned conceptual frameworks, suggesting the pertinence of an empirical study that explores the research problem.
- e) This empirical study is fraught with uncertainty because it addresses some gaps in research. TBL has focused on certain disciplines, it is virtually absent before university, it has barely been explored as a change driver beyond the classroom, and it lacks a validated tool for measuring teachers' lived experience, an aspect virtually ignored by the literature on TBL but crucial in successful EC.
- f) For a decentralised school federation, this empirical study requires a TBL expert to lead the professional development of some innovators within a supportive programme. One that includes initial face-to-face training and constant mentoring through a virtual community of practice.

The next section specifies the design of the empirical study undertaken in the light of these conclusions to provide evidence for the Steering Committee to decide whether to disseminate TBL.

3. RESEARCH DESIGN

This account of the empirical study starts by justifying the prioritisation of the teachers' perspective, refocusing the research problem and dividing it into smaller research questions. Afterwards, it details an inter-school intervention that will provide the empirical data to answer them. Then, it analyses how the nature of this intervention requires the adoption of a case study approach built on multiple, small action research cycles. Subsequently, it justifies why this perspective, this intervention, and this methodology require a mixed-method approach that collects qualitative and quantitative data through a variety of tools, both online and offline. Finally, it addresses some ethical issues posed throughout the research process.

3.1 Teachers' perspective and research questions

The literature review has shown that successful EC ultimately depends on how teachers experience innovation, an aspect widely ignored within the TBL framework, as noted in the unsatisfactory experience at the University of Michigan. It has also shown that piloting TBL requires the voluntary involvement of innovators, those willing to make a shift, in a professional development programme. Arguably, deciding whether to promote TBL institutionally should firstly be evaluated in the light of the stance on TBL of those expected to lead change across the federation. This entails rewording the initial research problem as follows: **to what extent do sixth-form innovators consider the institutional promotion of TBL to be a suitable strategy to drive educational change?** This problem can, in turn, be divided into the following research questions:

- a) How transformative do sixth-form innovators consider TBL to be?
- b) How willing and able would they be to adopt TBL?
- c) How feasible do they consider the dissemination of TBL across the school to be?
- d) What would the best organisational arrangements to achieve that be?

Subsection 3.2 addresses the school intervention that will provide the empirical data to answer them.

3.2 Inter-school intervention

The design of the intervention draws on the literature review, integrating the contributions from the field of EC, the TBL framework, and organisational development theory. It implements a one-year teacher professional development programme that moves through the following stages: 1) adopting a leadership

approach, 2) recruiting participants, 3) facilitating an initial face-to-face workshop, 4) mentoring an online CoP, and 5) leading a final plenary meeting.

3.2.1 STAGE 1: ADOPTING A LEADERSHIP APPROACH

A comparative study of the experiences at the University of South Alabama and at the University of Michigan suggests the centrality of the expertise of those leading the promotion of TBL. As a TBL practitioner, I was aware that the highly qualified support given at the former institution was unfeasible for my federation, and that avoiding the inconsistency of execution experienced at the latter was crucial. Accordingly, I tried to ensure fidelity of implementation by becoming a TBL expert, able to mentor some of the school federation teachers. I applied to, and was accepted on, the official TBL Trainer-Consultant Programme mentioned in subsection 2.3.3.3: 'a two-year development programme' meant to ensure the TBL practitioners' 'capabilities in developing and facilitating the delivery of TBL courses and in mentoring and supporting others in implementing TBL' (TBLC, 2018). It included a face-to-face workshop in the United States of America (USA) and a subsequent mentoring process that will end in December 2018.

3.2.2 STAGE 2: RECRUITING PARTICIPANTS

Instead of imposing the adoption of TBL without testing its suitability, as at the University of Michigan, I tried to maximise success by the careful selection of participants. Following the experience at the University of South Alabama, I drew on the contributions of organisational development theory, trying to recruit the 16% of sixth-form teachers unsatisfied with, and willing to seek an alternative to, traditional lecturing in the 12 schools offering a sixth form within the federation. Given their geographical distribution throughout Spain (Appendix 1), distributed leadership is not an option but a necessity. The identification of the prospective innovators followed the usual procedure and was delegated to the school headteachers. To ensure their buy-in, as with the University of South Alabama, I tried to impress upon them the importance of this empirical study by presenting it in the ordinary, four-day headteachers' meeting, which was led by the Federation Steering Committee in Madrid in February 2017. I informed the 21 headteachers of the federation about the nature, the scope, and the relevance of the study, and about its strong impact on the institutional strategy at federation and school level.

As the leader of the project, I asked them to take the following steps:

- a) identify sixth-form teachers unsatisfied with traditional lecturing and willing to make an extra effort to change their practice;
- b) inform them individually by presenting the project as an opportunity for professional development, emphasising the implications and the extra work involved in it;
- c) give them the opportunity to consider joining the project voluntarily;
- d) gather the teachers' feedback by May 2017;
- e) let me know the details of those willing to join the project.

The result was a group of 18 volunteer teachers from 9 different subjects (Table 1) teaching over 500 students in 12 different schools. No candidate showing interest was excluded. The next two subsections will specify the organizational arrangements made to provide them with the professional development and the supportive environment outlined in the conclusions of the literature review: an initial 2-day, face-to-face workshop and an online mentoring process through a virtual CoP.

Table 1: number of teachers per subject

Teachers	Subjects
1	Spanish
2	Anatomy
4	Economics
2	Mathematics
2	Biology
1	Earth and Environmental Sciences
3	Philosophy
2	History
1	Scientific Culture

3.2.3 STAGE 3: FACILITATING A 2-DAY FACE-TO-FACE TBL WORKSHOP

In July 2017, the 18 participants were summoned by me, on behalf of the Federation Steering Committee, to a 2-day workshop held in Madrid to a) provide them with the necessary 'experiential learning' about TBL (Nelson & Tweddell, 2017, p. 112) and b) build a sense of belonging to a community of members who share interests, concerns and expectations (Styron et al., 2015). The workshop, chaired by the Federation Executive Secretary to convey the institutional commitment, unfolded in 5 parts: introducing the workshop, experiencing TBL, creating a complete TBL unit, explaining the mentoring process, and evaluating the workshop.

The Executive Secretary welcomed participants, emphasising the relevance of this project for the federation, for the schools, and for themselves. Then, I presented the workshop structure and gave them access to the module created on the institutional virtual learning environment (VLE), where materials were available and a forum for the virtual CoP was accessible. During the first day (afternoon), I had participants read bespoke materials individually for 90 minutes, addressing two topics: the essential elements of TBL, and the institutional strategy. Understanding the impact of TBL on the strategy would help participants appreciate the importance of their participation, an aspect essential to promote their 'buy-in' (Estis, 2017, p. 97), to avoid superficial implementation (McLaughlin & Mitra, 2002), and to achieve 'deep reform' (Fullan, 2015, p. 34). Then, I led the subsequent TBL session for them to experience TBL as students. This experiential learning was enough for them to realise how far TBL improves students' learning outcomes.

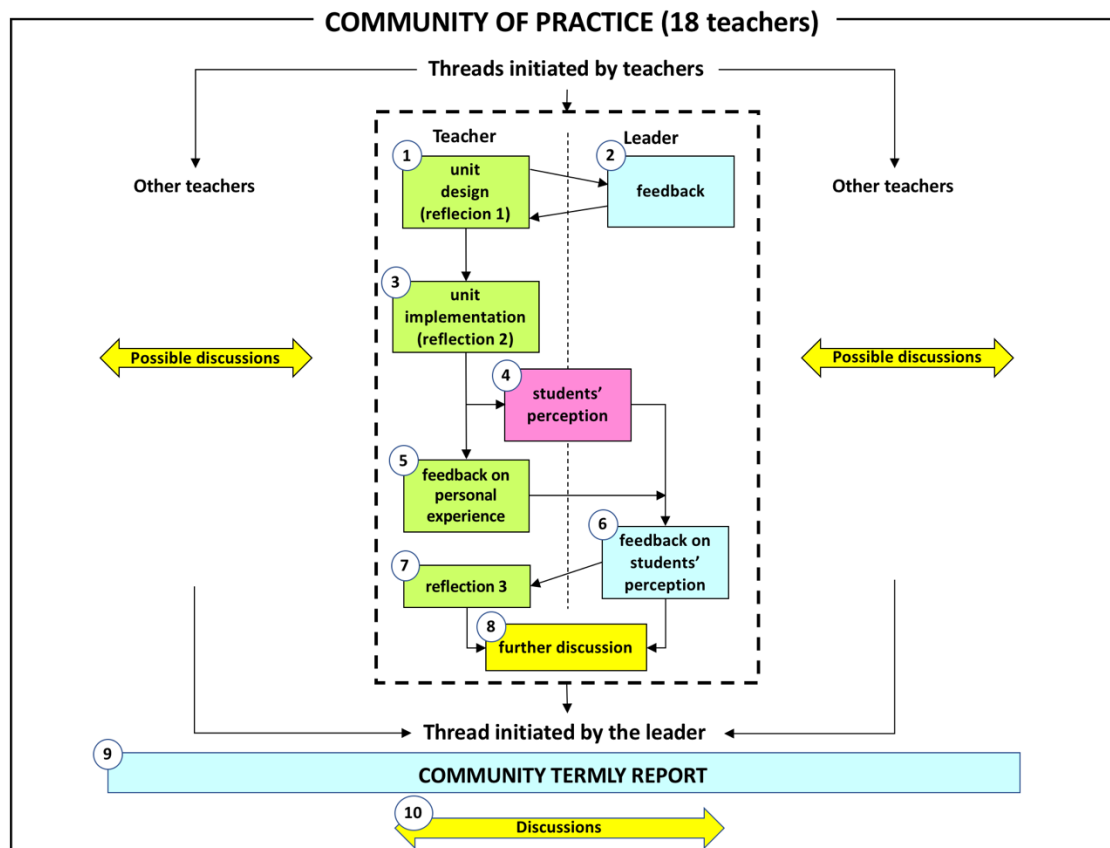
As the change involved in TBL is dramatic, and the design phase is critical, I allocated the second day to helping participants create a complete TBL unit, using a 'template' to ensure fidelity to TBL (Remington et al., 2015, p. 129). On the last day (morning), I explained the place of this programme within a multi-year institutional project that started with my Part 2 assignment, and presented the tasks involved in it: the design, implementation and evaluation of a TBL module per term during the academic year 2017-18 (3 weeks in total). I also presented the virtual CoP, created on the institutional VLE, to facilitate personalised monitoring, emphasising collaboration. Finally, participants evaluated the effectiveness of the workshop via a questionnaire (Appendix 2).

3.2.4 STAGE 4: MENTORING A VIRTUAL COMMUNITY OF PRACTICE

Selecting appropriate communication tools for online CoPs requires 'establish[ing] clear goals' (Liu, 2012, p. 706). This CoP aimed to a) enable personalised mentoring in the design, implementation, and evaluation of TBL units, b) gather qualitative data about the teachers' experiences, and c) foster collaboration by sharing materials, experiences, and discussions.

I decided to include termly online forums on the module created on the institutional VLE, a tool successfully used in virtual CoPs (Barab et al., 2003). Figure 1 shows the functioning of the forum.

Figure 1: structure of the online termly forum



Every term, I asked teachers to initiate a thread of conversation, sharing the design of their TBL unit. Then, I provided them with personalised feedback on all the elements of the unit before implementation. After the implementation, they helped me gather students' perceptions by having them complete Mennenga's (2012) validated questionnaire online, and shared their personal experiences. Afterwards, I posted a complete report about the students' perceptions with them, initiating a discussion. During these threads of conversation, some discussions between teachers arose. At the end of every term, I initiated a thread to share a general community report (Appendix 3) which stimulated further discussion by addressing the following aspects: a) students' overall perception, including the percentage of students welcoming TBL (and areas for improvement) and the percentage of students resisting TBL (and possible causes); b) teachers' overall experience, including patterns identified and lessons learned; and c) my evaluation of the process, emphasising the teachers' participation.

I tried to establish 'a sense of genuine trust' with participants, approaching them as a 'facilitator' rather than as an 'evaluator' (Styron et al., 2015, p. 201). I also tried to reinforce the supportive character of

the mentoring process by involving headteachers in it; I made the most of the ordinary meeting held in Madrid in February 2018 by sharing the evolution of the CoP with them and asking them to closely follow up the participants' evolution, and to support them. The outcomes are shown in tables 2 and 3.

Table 2: number of TBL units per term

Term	TBL units
1	18
2	16
3	17

Table 3: number of TBL units per teacher

TBL units	Number of teachers
3	16
2	1
1	1

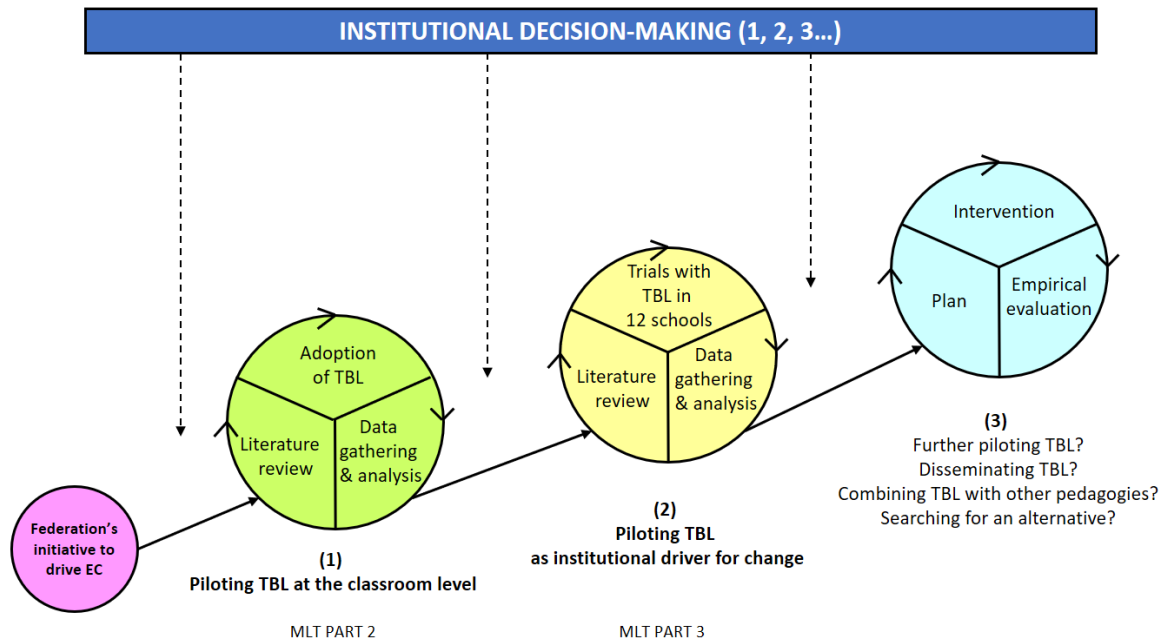
3.2.5 STAGE 5: LEADING A FINAL COMMUNITY-BUILDING EVENT

To complete the programme, 14 participants were able to attend a final meeting in Madrid in June 2018 with the following aims: a) build community, receive institutional support and reinforce a sense of belonging to a relevant project (Freeman, 2012); b) review the most recurrent issues in the design of TBL units; c) share the conclusions of this study that were then available; d) collect the participants' final stance on the suitability of TBL as a driver for active learning; e) reevaluate the suitability of the initial workshop in terms of the effective change delivered after one year of practice (e.g., Kirkpatrick & Kirkpatrick, 2006); f) evaluate the organisational arrangements of the project to find areas for improvement; and g) reflect on the way forward.

3.3 Methodology: a single case study

The focus on the teachers' perspective, the research questions, and the inter-school intervention suggest that the most suitable approach for this empirical research is a case study rather than action research. While being an umbrella term (Kelly, 1985), action research has a number of key principles (Kemmis et al., 2014), some of which do not meet the requirements of this study. First, its underlying 'inquiry cycle' starts with the identification of 'a problem of practice' (Lochmiller & Lester, 2016, p. 234) and primarily intends to transform this rather than to increase knowledge (Hopkins, 2002). In contrast, the transformation involved in this study is only a means to an end; the starting point is not primarily a problem of practice but the necessity for knowledge: building evidence to inform institutional decisions. Second, the action research process unfolds as a spiral of cycles (McKernan, 1991), whereas this study is the second step of a wider project, unfolding through linear stages (Figure 2). It is the exploration of a particular case to inform the institutional decision-making of the federation.

Figure 2: stages of the institutional project

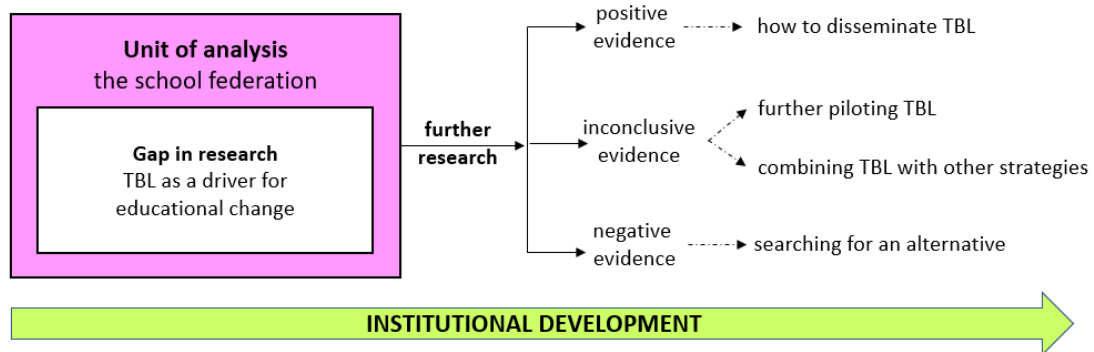


Adapted from (Edwards & Talbot, 1999, p. 78)

A case study, conversely, fits the above-mentioned particularities. Certainly, there is no unequivocal definition of a case study either (Cohen et al., 2011), but it is always the exploration of a particular instance (Stake, 1995). It is an 'in depth analysis of a single event... over a defined period of time' (Hitchcock & Hughes, 1995, p. 317) which 'can provide powerful human-scale data on macro-political decision making' (Cohen et al., 2011, p. 291), such as teachers' experiences when piloting TBL for a year to inform the federation's strategy. It is appropriate to explore 'the experience of staff development' when facing 'innovation' (Hitchcock & Hughes, 1995, p. 321), allowing the study to address the research questions, which are focused on the teachers' perspective.

There are multiple case study taxonomies (Merriam, 1988; Robson & McCartan, 2016), but this paper fits into Yin's (2013) exploratory and single-case typology well. This is a preliminary exploration aimed at finding evidence that casts some light upon further research and further institutional development; one that has just one 'unit of analysis' focused on addressing 'an opportunity to research a case heretofore unresearched' (Cohen et al., 2011, p. 291): piloting TBL to drive EC in the sixth form in a Spanish school federation (Figure 3).

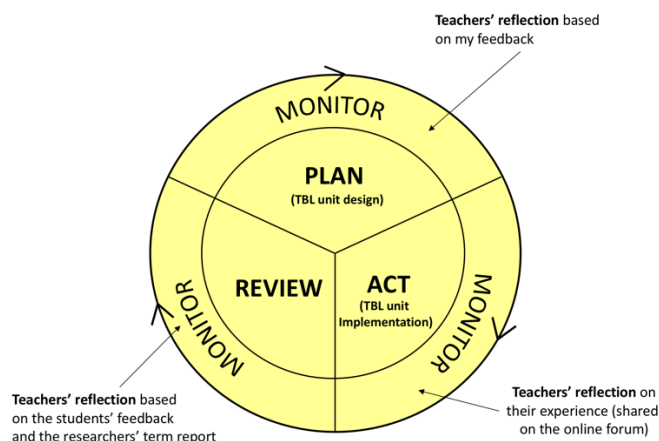
Figure 3: exploratory and single-case study



Adapted from Yin (2013, p. 8)

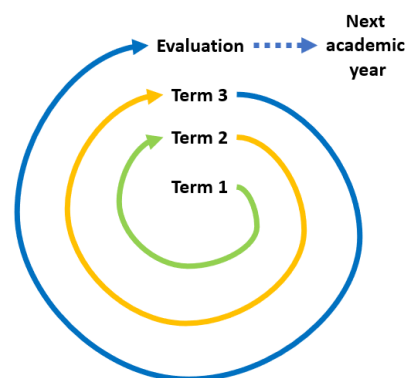
However, while maintaining just one focus (the federation), this case study is complex; case studies can use other methodologies such as action research within them (Cohen et al., 2011; Lochmiller & Lester, 2016), and this one builds on small action research cycles. It engages 18 sixth-form teachers in a spiral of self-reflection that assesses their practice on a termly basis (Figures 4 and 5), turning them into 'self-evaluating practitioner[s]' (Edwards & Talbot, 1999, p. 61) and 'researchers' (Stern, 2010, p. 133). This approach is particularly pertinent for this study as 'action research is frequently incorporated into staff development programmes which support institutional development' (Edwards & Talbot, 1999, p. 77).

Figure 4: teachers' action research cycle



Adapted from Edwards & Talbot (1997, p. 63)

Figure 5: teachers' action research spiral



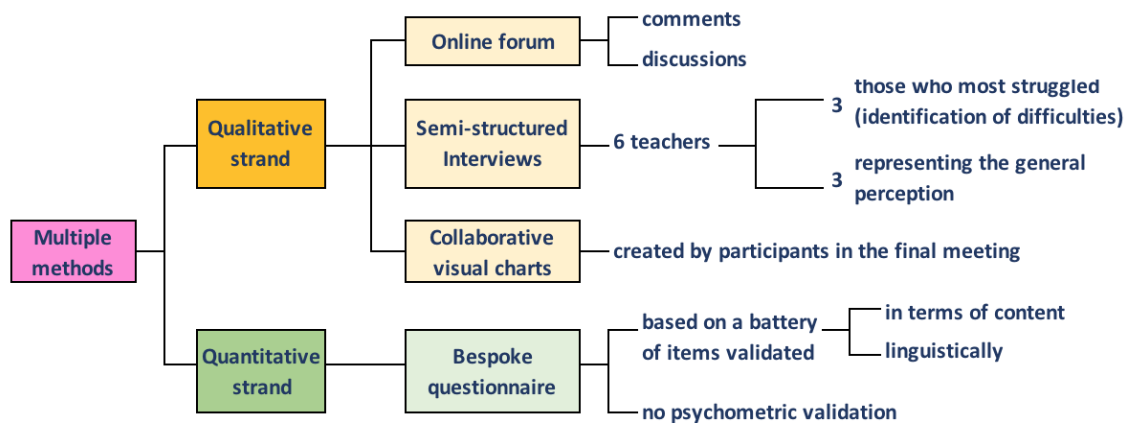
The next subsection explores the tools that better allow this case study to gather the data necessary to answer the research questions.

3.4 Methods

3.4.1 A MIXED-METHOD APPROACH

This case study adopts a mixed-method approach, combining qualitative and quantitative data for a better-informed institutional decision (Figure 6). Certainly, ‘methodological eclecticism’ can be disputed (Yanchar & Williams, 2006, p. 6), but ‘mixed methods research is growing in popularity’ in education (Lochmiller & Lester, 2016, p. 214), has been used in the study of teachers’ attitudes towards EC (e.g., Giannakaki, 2005), and is ‘the norm’ in case studies (Hitchcock & Hughes, 1995, p. 319) since listening ‘through many sources’ (Cohen et al., 2011, p. 296) allows researchers to find sounder evidence through data triangulation (Denzin, 2017).

Figure 6: methods used for data collection



The focus on the teachers’ experiences requires the collection of qualitative data, widely considered as particularly suitable to gain a deep understanding of how people make sense of, and react to, their own circumstances (Denzin & Lincoln, 2011). I gathered them through three sources: feedback and discussions on the online forum of the CoP, interviews, and collaborative visual charts in the final meeting. I organised and coded them using NVivo12 (www.qsrinternational.com), qualitative data analysis software used for research into teachers’ emotions (Lee & Yin, 2011), CoPs (Komorowski et al., 2018), and EC (Holmes et al., 2013), from mixed-method approaches (Sammons et al., 2014), and, more relevantly, from the few studies addressing TBL from the teachers’ perspective (Nelson & Tweddell, 2017; Tweddell et al., 2016).

Nonetheless, additional quantitative data collection through a questionnaire is also appropriate. First, I lack experience in conducting interviews, which are a complex research tool that require expertise (Wilkinson &

Birmingham, 2003). Second, as usually happens within the TBL framework, I am strongly committed to TBL, and the sole use of qualitative methods would possibly involve a strong bias. Finally, one of the major limitations in empirical research into TBL is the lack of 'validated measurement instruments' (Haidet et al. 2014, p. 313); the TBL framework has a validated questionnaire to measure the students' experiences (Mennenga, 2012) but not that of teachers. This case study is a great opportunity to address this gap by contributing something positive to the prospective development of that validated tool. The next subsections address the methods of both strands

3.4.2 ONLINE FORUM AND INTERVIEWS

Due to the dispersal of participants, I decided to use the online forum as a method (Lee & Yin, 2011) for gathering data about educators' experiences and their evolution over time. Following the few studies addressing the teachers' perspective within both the TBL framework (Nelson & Tweddel, 2017; Tweddell et al., 2016) and the field of EC (Holmes et al., 2013; Lee & Yin, 2011), I also conducted 6 semi-structured interviews. They are flexible enough to adapt the questions to every situation (Adler & Clark, 2003) and particularly suitable for eliciting 'in-depth understandings of a phenomenon of interest' (Lochmiller & Lester, 2016, p. 151). The interview questions (Appendix 4), open-ended and non-leading to avoid bias as far as possible (Roulston, 2010), were defined against the research questions and inspired in the above-mentioned four studies addressing the educators' experience.

To make the volume of data manageable, I decided to interview 6 teachers (30%), 4 of them via Skype; the participants were scattered throughout the country, and going online can also be a solution for interviews (Paulus et al., 2016). As 'significance rather than frequency is a hallmark of case studies', and 'critical incidents of events occur that are crucial to the understanding of the case' (Cohen et al., 2011, p. 293), I used the online forum to select teachers with different biases. I selected the 3 teachers who could best help me identify problems: the one who had to confront unusual student resistance, the one who struggled the most with the extra effort involved, and the one who most struggled to design appropriate application activities. I also selected 3 participants representative of the prevalent perception. All of them were happy to accept the invitation. As my institutional position might be intimidating (Wilkinson & Birmingham, 2003), I tried to make them feel comfortable by emphasising that I was not an outsider but somebody jointly

working and facing innovation with them in this programme, and that they were 'doing [me and the school federation] a favour, not being interrogated' (Cohen et al., 2011, p. 425). The interviews lasted 20-25 minutes, were audio-recorded, anonymised, transcribed, and coded.

3.4.3 A BESPOKE QUESTIONNAIRE

In the absence of a reliable tool for measuring the educators' experience with TBL, I started creating an initial battery of items intended to become the basis for the prospective development of a validated survey. First, I identified 6 aspects that could capture the transformative potential of TBL and developed them through a battery of 38 questions expressed from the teachers' perspective, covering advantages and disadvantages, with reverse scores to minimise bias (e.g., Rattray & Jones, 2007). Then, to ensure that both no relevant aspects or items were excluded and all those included were relevant, content validation was conducted by an international panel of 3 TBL experts from Australia, the United Kingdom (UK) and the USA (Appendix 5). Finally, to avoid ambiguity, linguistic validation was conducted by senior TBL practitioners from Australia, Singapore, the UK, the USA, and Spain. The resulting battery included 42 items (Appendix 6).

Drawing on this initial battery of items, I designed a bespoke questionnaire by using the research questions as subscales, selecting the items with a greater impact on these questions. Since the initial battery of items did not address the research question d) concerning the specific organisational arrangements required for piloting TBL in a decentralised school federation, I decided to add 5 items evaluating the arrangements made for this study. The bespoke questionnaire included 31 items, some of them with reverse scores in all 4 subscales (Appendix 7). While it is true that intervals in rating scales might not match the graduation of intensity of feelings (e.g., Friedman & Amoo, 1999), I decided to use a 5-point Likert scale for two reasons: a) it allows participants to 'express their true feelings' by including the possibility to 'express feelings of neutrality in their experiences with team-based learning' (Mennenga, 2012, p. 169); and b) it provides a neutral point which makes it easier to interpret the results. The directions for interpreting the result also included an additional, total subscale that provides a general picture answering the general research problem. This questionnaire was completed voluntarily online by all the participants before the final meeting.

3.4.4 COLLABORATIVE VISUAL CHARTS

While graphic organisers are not among the methods ‘commonly associated’ with case studies (Lochmiller & Lester, 2016, p. 35), ‘educational researchers can draw on... graphical representations’ (Cohen et al., 2011, p. 528), and ‘respondent-generated visual data... is useful as a way of gaining a graphic overview of subject matter’ (Prosser & Loxley, 2008, p. 24). Accordingly, I used the visual charts produced by participants in the final meeting. In contrast to recordings, which would have required transcription, codification, and interpretation, they were a time-saving and effective tool to elicit, organise, and interpret participants’ stances and the arguments supporting them.

Visual charts were the outcome of three activities aimed at evaluating the organisational arrangements of the intervention. For each activity I created different teams to maximise participants’ interaction. Then, I posed one question for them to reflect collaboratively for 15 minutes. Afterwards, I showed them a poster with three possible stances on the question, which included rival positions and a neutral point to minimise bias, and asked them to choose their own one individually. Subsequently, they wrote their supporting arguments on coloured post-it notes and pasted them on the poster (Appendix 8) creating a sort of traffic light. The resulting charts were evaluated in plenary discussions.

3.5 Ethics

This case study is complex in terms of ethics due to both the scope of the intervention and the use of online methods which have ‘some unique features as distinguished from other forms of research “offline”’ (Thorseth, 2003, p. vii).

In ‘procedural’ terms (Roberts, 2015, p. 314), I firstly identified potential ethical issues in the light of the guidelines of the British Educational Research Association (2011) and then received ethical approval from the University of Oxford’s Central University Research Ethics Committee (Appendix 9). For the inter-school intervention, I collected the written, informed consent of both the federation’s Executive Secretary and the 12 school headteachers (Appendix 10). In the initial workshop, participants were openly and fully informed about the implications in terms of workload, monitoring process, recordings, reports for research, and their right to withdraw at any moment. They had the whole summer to give their consent.

No sensitive topics were addressed, but the increase in workload involved might have caused distress (Freeman, 2012). To avoid emotional harm and discomfort, I repeatedly emphasised that participation and tasks were an opportunity for professional development rather than an obligation, and that participants were free to decide the degree of their involvement. This approach minimised issues derived from 'the power dynamics inherent in conducting research' (Mockler, 2014, p. 155); I was seen as a facilitator and as an 'innovation champion' (Freeman, 2012, p. 164) in a management position who leads by example, rather than as the Academic Excellence Coordinator.

Anonymity and confidentiality are crucial (Creswell & Creswell, 2017). Anonymity was ensured by a) omitting participants', schools', and federation's name in this study; b) conducting the questionnaire online; and c) using pseudonyms in the recordings, transcriptions, and management of interview data. Confidentiality was guaranteed by saving all the data under double passwords (files and PC) and removing them once this case study was finished. The online forum deserves special mention because the difference between private and public in virtual communities is 'hazy' (Kantanen & Manninen, 2016, p. 86). Participants were not anonymised on the online forum for three reasons: a) they had already met each other in the initial workshop; b) the forum was a stable 'living group of interacting human beings' (Bromseth, 2003, p. 73); and c) it would contribute to reinforcing the sense of community. Nonetheless, confidentiality was ensured; the forum was hosted on a module administrated by myself, on the institutional VLE, and under username and password, representing a kind of 'public arena' (Mann, 2003, p. 38) within a private space.

In terms of 'situated ethics' (Calvey, 2008, p. 905), the online forum posed additional dilemmas throughout the research process. As with online research 'solutions cannot be standardized and disciplined' (Markham, 2006, p. 52), so I tried to address them in a 'case-based' form (Kantanen & Manninen, 2016, p. 86). One of the participants, who was reading for a master at a Spanish university, asked for my permission to use the data of the first term report. Beyond the unauthorised use of such data, I considered the extent to which participants should be given data about their students' perceptions. As the data was anonymised, and regular feedback was essential for participants' self-reflection and professional development, I decided to keep sharing it. However, this posed the additional question of data ownership and to whom data on the

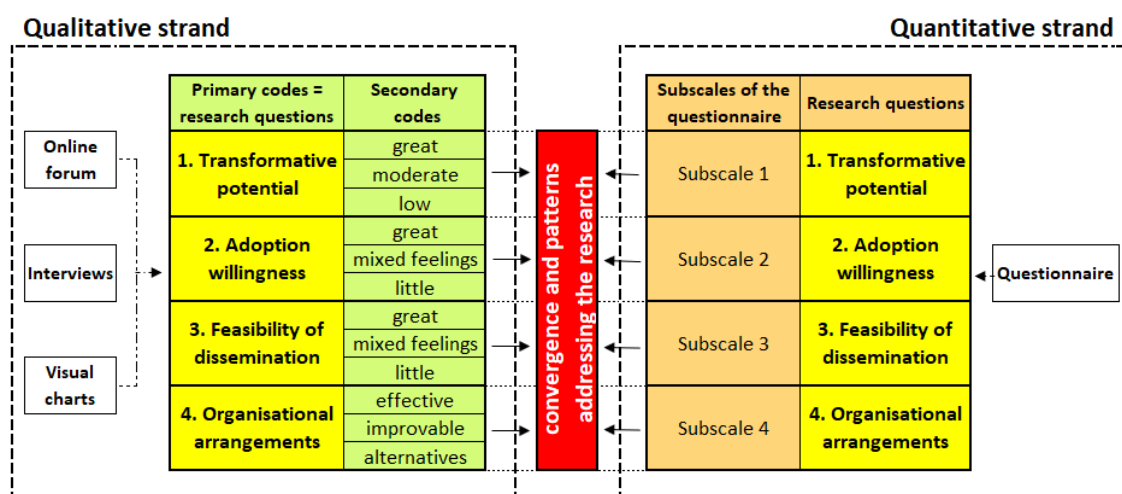
online forum belonged. As the researcher, and at the same time the Federation Academic Excellence Coordinator, I considered that the information shared on the forum did not belong to either the individual participants or anyone in the community, but to the federation; not for nothing was it hosted on the institutional VLE, becoming an integral part of an institutional professional development programme.

4. RESEARCH FINDINGS

4.1 Data analysis approach: triangulation and graphic display

The analysis of data gathered through mixed methods can adopt different strategies. A complementary approach uses the qualitative strand to illustrate and better understand quantitative data, like Giannakaki's (2005) analysis of the teachers' feelings 'when confronted with an educational reform' (p. 324). However, this prioritisation of the quantitative strand appears inappropriate if the survey used lacks validation, as noted in the case of Freeman (2012), the only analysis addressing the teachers' experience with TBL using mixed-methods. Consequently, since the questionnaire used in this case study lacks psychometric validation and, like the rest of methods used, is possibly biased, the best approach appears to be data triangulation (e.g., Denzin, 2017); it strengthens the validity of the analysis by finding convergence through the combination of multiple and independent methods with offsetting limitations (e.g., Caracelli & Greene, 1993). Figure 7 illustrates the triangulation method used by this study to find convergences.

Figure 7: triangulation method



Quantitative and qualitative strands were addressed independently of each other during the academic year and finally integrated into the data analysis phase. Quantitative data was organised by assigning the subscales of the questionnaire to the research questions. Qualitative data was transcribed verbatim to prioritise the participants' voice (e.g., Saldaña, 2015), including utterances and Jeffersonian symbols in the interviews to capture the possible existence of mixed-feelings (e.g., Lochmiller & Lester, 2016) by using transcription software called Express Scribe (www.nch.com.au/scribe/). As 'reliability and validity of study

data' are challenging with non-English-speaking participants (Lopez et al. , 2008, p. 1729), translation into English was conducted in the reporting phase, trying to minimise bias by expressing my comprehension 'in generally comparable target-language material... as credibly... and appropriately as possible' (Gaddis, 2008, p. 6). Transcripts required the development of a coding method that would best respond to the nature of the research problem (Saldaña, 2015). To keep focused, they were primarily coded against the research questions by using qualitative data management software (nVivo12). The analysis also included secondary codes for three reasons: a) they might help reduce bias by searching for convergence in rival perceptions; b) they can provide the graduation, intensity, and frequency required by the research questions; and c), in providing a neutral point, they might make the combination with the Likert-scale of quantitative data easier.

Convergence and patterns found through data triangulation are discussed in the light of the literature and presented in 4 sections to address the 4 research questions. To maximise clarity, each section is divided into 2 subsections. The first subsection provides the main convergence by comparing a chart of the total result of the questionnaire subscale with a graphical display of the codification of participants' stances in the qualitative strand. The Likert-type scale used in the questionnaire provides a neutral point between the highest and the lowest possible level that enables either a positive or negative interpretation of the results. A table used to display the frequency and the intensity of participants' stances also enables a positive or negative interpretation by using the colours of a traffic light: green is positive, orange is neutral, and red is negative. The second subsection provides a closer analysis of the main convergence; it shows the degree of consistency between the results of the subscale items and patterns in the participants' comments on the online forum, in the interviews and in the visual charts.

The findings yielded from this approach suggest the following answers to the 4 research questions:

- a) sixth-form innovators consider TBL to be deeply transformative;
- b) they are quite willing, albeit still not sufficiently able, to adopt it;
- c) they think that its dissemination is quite feasible with appropriate institutional support; and
- d) they consider that this support should combine experiential training with ongoing mentoring.

4.2 Participants consider TBL to be deeply transformative

The first research question concerns whether participants' experience of change aligns with the literature on both EC and TBL. In terms of scope, it addresses the extent to which they consider that TBL 'give[s] the appearance of change without the reality of change' (Hanson, 2001, p. 653) or, conversely, has potential as a driver for a 'paradigm shift' (Sibley & Parmelee, 2008, p. 47). In terms of its nature, it addresses the extent to which they consider TBL to adopt the constructivist, active, collaborative, and engaging approach of the transformative conceptual frameworks devised by the recent approaches in the field of EC which emphasise the centrality of pedagogy (e.g., Hargreaves & Shirley 2009). Data triangulation between the qualitative and the quantitative strands yields a strong convergence, suggesting that TBL represents a dramatic shift and has the makings of a driver for EC.

4.2.1 TBL REPRESENTS A DRAMATIC SHIFT

The scope of the change involved in piloting TBL is shown by the triangulation between the result of the questionnaire subscale 1 (Figure 8) and the graphical display of the codification of participants' comments on the online forum and in the interviews (Table 4). The high degree of convergence suggests that their experience with TBL does not appear to differ significantly from that of university TBL adopters, for whom TBL 'is not a minor innovation' (Freeman, 2012: 163) and requires that teachers use 'the proverbial paper shredder', starting the syllabus 'from scratch' (Roberson & Franchini, 2014: 16).

Figure 8: result of the questionnaire subscale 1 on the transformative potential of TBL

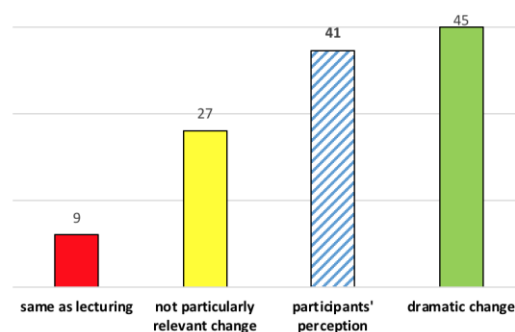


Figure 8 shows the total result of the questionnaire subscale 1, measuring the transformative potential of TBL for those who move from traditional lecturing. Participants' perception is on the right of the neutral point (yellow column), indicating that TBL is seen as a transformative pedagogy. The score of 41, very close

to the highest possible level, indicates that the scope of the change is very relevant and, far from remaining 'on the surface' (Fullan, 2015, p. 6), is experienced as dramatic.

Table 4: codification of the participants' experience of change

		STANCE OF THE 18 PARTICIPANTS																	
Great	online forum																		
	interviews																		
Moderate	online forum																		
	interviews																		
Low	online forum																		
	interviews																		

Table 4 displays graphically the result of the codification of participants' experience of change in the qualitative strand. Using the metaphor of a traffic light, the overwhelmingly green colour is a positive sign: the immense majority of participants experience TBL as a great change. No participant considers it to be low (red colour), and even the 2 participants who are less optimistic (orange colour), for they had already used other active pedagogies, find it transformative:

I usually use the flipped classroom, but activities are not as significant as in TBL. This is precisely what I find very difficult... Linking activities to the students' lives has great potential... (Online forum).

I have used other innovative methodologies, but designing units backwards pushes yourself to the next level... (Interviewee 1).

4.2.2 TBL HAS THE MAKINGS OF A DRIVER FOR EC

The nature of the change involved in piloting TBL is shown by a more detailed triangulation between the distribution of participants' answers to the subscale 1 items (Table 5) and their comments in the qualitative strand. The great degree of consistency supports that TBL might make the constructivist, active, collaborative, and engaging conceptual frameworks devised in the field of EC truly operational.

Table 5: distribution of number of participants answering the subscale 1 items

	Strongly disagree	Disagree	Indecision	Agree	Strongly agree
1. Having students learn to apply content and concepts to real situations is easier through TBL than through traditional lecturing				4	14
2. Students' learning is deeper and longer lasting through traditional lecturing than through TBL	11	4	3		
3. In TBL, the students' thinking process can be refined and refocused by the teacher				5	13
4. TBL leads teachers to focus on the development of skills and capabilities rather than just on covering content		1	1	5	11
5. Adopting TBL requires student learning to focus on content acquisition by listening to the teacher rather than by actively building their own knowledge	11	7			
6. By implementing TBL I am a guide and a facilitator rather than an instructor				5	13
7. TBL represents a major change in my teaching practice				9	9
8. Peer evaluation develops the accountability of students to their teams				12	6
9. In a TBL class, effective peer learning takes place			1	12	5

The conviction that TBL adopts a more constructivist approach than lecturing is clearly expressed by almost all participants (90%) in the questionnaire (items 1 and 4), and all of them in the qualitative strand:

Students realise that the subject applies directly to their everyday life. I really think that with TBL my subject is not merely limited to receive theory, but they learn how to apply it... (Online forum).

What we have learnt is that students forget about everything they have to memorise. I am convinced that this won't happen with TBL as they really experience content. Maybe they don't realise it now but over time they will... There are things they will never forget... (Interviewee 5).

The change towards active learning in teachers' and students' roles are recognised by 100% of participants in the questionnaire (items 5-6) and is pervasive in the qualitative strand:

The most relevant aspect is the constant interaction of knowledge from different pupils. I was delighted to see discussions and refutations between them. I just see how students really think and orient them at just the right moment... (Online forum).

It [TBL] has allowed me to reach my students in a different way... They see me as a facilitator who is there to help them, rather than as an instructor or examiner. This is key. It gives you the opportunity to build a better rapport with them, to feel closer to them (Interviewee 6).

There is a strong agreement in the questionnaire (items 8-9) that TBL has an engaging collaborative nature, which was a recurrent comment in the qualitative strand:

Even students used to simply reproducing stuff individually in the exams get engaged in the debate... Students end up realising that they can learn a lot from each other. This helps break stereotypes... (Interviewee 2).

TBL encourages debate, and that's when learning happens, that's when knowledge really deepens (Online forum).

In sum, the high degree of convergence found by data triangulation concerning the first research question suggests that participants experience TBL as a dramatic change. One that makes the transformative conceptual frameworks devised in the field of EC operational.

4.3 Participants are quite willing, albeit still not sufficiently able, to adopt TBL

The second research question concerns participants' willingness and ability to adopt TBL, and the reasons for that. The convergence shown by the triangulation between the qualitative and the quantitative strands suggests that, while participants see TBL very positively, the dramatic change involved in it makes them feel insufficiently able to adopt it yet. This appears to align with the only study addressing 'whether to adopt

Team-Based Learning’, which concluded that the ‘pedagogical compatibility’ of TBL with the adopter’s pedagogic culture influences the adoption decision (Freeman, 2012, p. 166).

4.3.1 TEACHERS WOULD LIKE TO ADOPT TBL

Participants’ willingness and ability to adopt TBL is conveyed by the degree of convergence found by the triangulation between the result of the questionnaire subscale 2 (Figure 9) and the graphical display of the codification of participants’ opinions in the qualitative strand (Table 6). It suggests that participants would like to adopt TBL, but with a degree of caution; managing TBL takes time, and ‘incremental adoption is an option’ (Freeman, 2012, p. 165) rather than a bad choice (Remington et al., 2015).

Figure 9: result of the questionnaire subscale 2 on participants’ willingness to adopt TBL

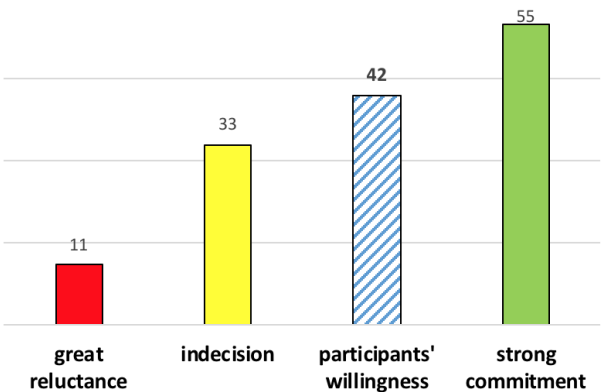


Figure 9 shows the total result of the questionnaire subscale 2. As participants’ willingness to adopt TBL is on the right of the neutral point that indicates indecision (yellow column), their predisposition is positive. However, the degree of willingness is not strong; the score of 42, while far from any sign of reluctance, is not that close to the highest possible level.

Table 6: codification of the participants’ comments on their willingness to adopt TBL

		STANCE OF THE 18 PARTICIPANTS															
Great	online forum																
	interviews																
Mixed feelings	online forum																
	interviews																
Little	online forum																
	interviews																

Table 6 graphically displays the frequency and the intensity of participants' opinions on the online forum and in the interviews. It suggests the concomitance of a generalised predisposition to adopt TBL with a degree of mixed feelings, tempering the strength of the participants' willingness.

4.3.2 ASPECTS IMPACTING PARTICIPANTS' WILLINGNESS

A more detailed triangulation between participants' answers to the subscale 2 items (Table 7) and their comments, both on the online forum and in the interviews, confirms their degree of willingness to adopt TBL, suggesting some underlying reasons.

Table 7: distribution of number of participants answering the subscale 2 items

	Strongly disagree	Disagree	Indecision	Agree	Strongly agree
10. Traditional didactic lectures are more effective than TBL in making students come to class prepared	11	7			
11. TBL gives teachers more opportunities than traditional lecturing to provide students with useful and timely feedback				1	17
12. TBL enables teachers to check students' conceptual understanding of key concepts more readily than traditional learning				8	10
13. TBL ensures that students work more actively than with traditional pedagogies, making the most of classroom time				4	14
14. I think that TBL is a change for the better			1	7	10
15. Implementing TBL appropriately requires a great deal of expertise and professional development by the educator			4	11	3
16. Designing TBL units takes a lot of effort and requires a lot of preparation prior to class			4	6	8
17. Designing appropriate application activities is easy	7	9	2		
18. Over time, the extra effort made in adopting TBL will pay off for educators			1	3	14
19. I am motivated to change other classes/courses to TBL			1	3	14
20. Implementing TBL took a lot longer than I expected	2	2	7	6	1

The questionnaire reveals that 95% of participants are keen to adopt TBL and no one is reluctant (items 14 and 19), which is confirmed in the qualitative strand:

I see myself using TBL systematically. If I had all materials prepared, I would adopt it right now, but... (Interviewee 5)

Items 10-13 show the main reason for that: 100% of participants consider TBL superior than lecturing in terms of classroom dynamics and learning outcomes. This is entirely consistent with their opinions in the qualitative strand; they are aligned with the literature, which emphasises that TBL is particularly 'enjoyable and educationally valuable' (Nelson & Tweddell, 2017, p. 102):

Sessions are very engaging, and students have fun... Participation contributes a great deal to the group, and learning is much more significant (Online forum).

In linking theory to students' reality, TBL consolidates knowledge much more efficiently, making it more lasting and meaningful than in traditional classes (Online forum).

The above-mentioned degree of mixed feelings does not appear to mean the concurrence of positive and negative attitudes towards TBL (item 18); rather, recurrent comments point to the necessity for a gradual adoption:

I want to adopt TBL as my usual teaching practice, but step by step. Being realistic, it is going to take me 3 or 4 years (Interviewee 3).

The questionnaire shows difficulties supporting this gradual adoption (items 15-17 and 20): 75% of participants consider that the increase in workload and the creation of appropriate application activities hampers the adoption of TBL, in line with the literature (e.g., Tweddell et al., 2016). These issues are also highlighted in the qualitative strand as possible reasons for the degree of mixed feelings:

Piloting TBL has been very positive although it takes a lot of work... I pays off mainly because you see how students get engaged... Ok, I am working a lot, but they are happy (Interviewee 4).

The hardest part of TBL is the adaptation of materials. Providing the fundamental content in a way that they can work autonomously in advance is time-consuming (Interviewee 1).

Application activities are amazing but have also been very challenging... The main difficulty is to make them really significant for students. How can you apply abstract content to the daily life of students? (Interviewee 6).

Two additional aspects provoking mixed feelings, while not addressed by the questionnaire, are relevant in the qualitative strand: the preference for a combination of different active pedagogies and, in line with the literature (Nelson & Tweddell., 2017), the existence of a systemic inconsistency between TBL and official exams:

I certainly will use TBL regularly, but complementarily with other active methodologies (Online forum).

I am afraid of implementing TBL in the upper sixth form because A-level exams are standardised, and pupils are going to confront something quite different to TBL. Unfortunately, A-level exams tend to be reproductive and content-focused in my subject... (interviewee 6).

In sum, data triangulation concerning the second research question suggests that sixth-form innovators and early adopters are keen to move to TBL but need time for a gradual adoption.

4.5 For participants, disseminating TBL is quite feasible with institutional support

The third research question concerns the extent to which participants consider the dissemination of TBL across the federation to be feasible. Data triangulation suggests that, by applying their personal experience

with TBL to their knowledge of their own school community, participants are optimistic. However, in line with the literature on both TBL (Freeman, 2012; Remington et al., 2015; Styron et al., 2015) and EC (Garcia-Huidobro et al., 2017), they consider institutional support to be crucial.

4.5.1 OPTIMISM

Participants' optimism is conveyed by the consistency found by the triangulation between the result of the questionnaire subscale 3 (Figure 10) and the graphical display of the codification of their comments in the interviews and on the online forum (Table 8). Albeit cautious, this optimism aligns with Styron et al. (2015) who emphasise that 'it is possible to successfully bring about a culture change' through TBL (p. 209).

Figure 10: result of the questionnaire subscale 3 on the feasibility of TBL dissemination

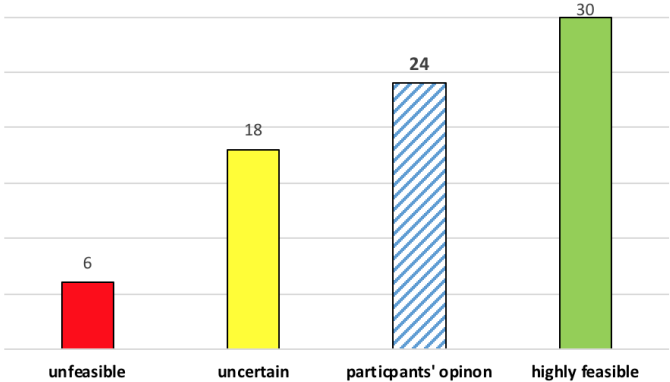


Figure 10 displays the total result of the questionnaire subscale 3, measuring participants' opinion on the feasibility of a successful dissemination of TBL. Their opinion is positive; it is on the right of the neutral point that indicates uncertainty (yellow column). However, as the score of 24 is in the middle between uncertainty (18) and high feasibility (30), their optimism is only moderate.

Table 8: codification of the participants' stance on the feasibility of TBL dissemination

		STANCE OF THE 18 PARTICIPANTS											
	online forum												
	interviews												
Mixed feelings	online forum												
	interviews												
Little	online forum												
	interviews												
		1	2	3	4	5	6	7	8	9	10	11	12
PARTICIPANTS GROUPED BY SCHOOLS													

Table 8 graphically displays the codification of the frequency and the intensity of participants' comments in the qualitative strand. There is a balance between green and orange colours with very little red, which, in

line with Figure 10, conveys an optimistic rather than sceptical picture. Although the focus of this study is on the federation, Table 8 also suggests a degree of heterogeneity in terms of staff background: 5 schools appear to be clearly positive, 6 are less optimistic, and only school number 10 is sceptical.

4.5.2 REASONS FOR OPTIMISM

Some of the reasons for the above-mentioned moderate optimism are shown by the consistency between participants' answers to the questionnaire subscale 3 (Table 9) and their comments in the qualitative strand.

Table 9: distribution of number of participants answering the subscale 3 items

	Strongly disagree	Disagree	Don't know	Agree	Strongly agree
21. My school teaching staff would be able to adopt TBL as pedagogic framework			10	7	1
22. The initial training required to implement TBL at my school level would be too demanding or would take too much time	1	7	9	1	
23. During the next academic year I would be able to effectively help other colleagues implement TBL			2	6	10
24. Teaching staff of my school would offer strong resistance to implementing TBL, making it difficult to use it as a driver for pedagogic change	3	4	11		
25. There would be strong resistance from students and their families to the adoption of TBL at school level.	4	8	5	1	
26. If teachers had institutional support, they would adopt TBL in my school			1	8	9

Participant's opinions about the prospective degree of resistance offered by the school community are moderately optimistic. Items 24-25 show that the majority of them (66%) are positive regarding both students' and families' initial attitudes, although 28% are uncertain, and 6% expect some opposition. Similarly, while 61% of participants are uncertain about the staff's predisposition, 39% are positive and none of them are pessimistic. This is also reflected in the qualitative strand:

Pupils may be reluctant at the beginning because it [TBL] is so different, but after one unit they are motivated and prefer TBL over lecturing... (Interviewee 3).

I shared my experience with my colleagues at a meeting, and they didn't look at me with a "what a drag" expression... so I think they liked it, but some of them will get afraid of the workload it takes... (Interviewee 5).

Participants are also optimistic regarding their own ability to help. Item 23 shows that 89% of them are confident about their positive contribution, and only 11% are uncertain. Nonetheless, they are also realistic; comments in the qualitative strand convey that they still need time to act as 'innovation champion[s]' (Freeman, 2012, p. 164) in the dissemination of TBL:

I see myself lending a hand, saying if I see or don't see something... but I will keep needing an expert transmitting confidence ... because I don't feel confident enough yet. (Interviewee 1)

I think I can help them [colleagues] not to make my mistakes, but I couldn't guide them. I could help them not to become discouraged when they struggle with something... (Interviewee 2).

The main reason for participants' optimism concerns professional development. Item 22 shows that, while 50% of them are uncertain, 44% consider the training required by TBL to be feasible, and only 1 participant (6%) too demanding. What is more, item 26 shows that 94% of them are positive with regard to the federation helping staff overcome all the possible difficulties by providing the appropriate support. The comments on the forum and in the interviews are consistent with this view:

It cannot be made all at once, but I think that step by step this is contagious. The institutional support provided to us will motivate and enthuse other colleagues, but they must participate voluntarily, without imposition (Interviewee 6).

In sum, based on both their experience with TBL and their knowledge of their own school community, sixth-form innovators are optimistic about the feasibility of the dissemination of TBL across the federation, inasmuch as it creates a supportive climate by making the appropriate organisational arrangements.

4.6 Participants consider a blended professional development programme to be suitable

The last research question concerns the organisational arrangements necessary to create the above-mentioned climate that will make it possible to disseminate TBL in the sixth form. A good way of addressing this question might be to evaluate participants' experience with the voluntary professional development programme described in this study, trying to identify areas for improvement. Data triangulation shows a strong convergence between the quantitative and the qualitative strands in this respect. In line with the non-managerial and capacity-developing approach highlighted by the literature on EC (e.g., King & Stevenson, 2017), participants are very positive towards the combination of the experiential training and the online, ongoing mentoring provided by the institution, suggesting only small improvements.

4.6.1 UNANIMITY ABOUT THE APPROPRIATENESS OF THE ORGANISATIONAL ARRANGEMENTS

The appropriateness of the organisational arrangements made in the inter-school intervention is shown by the high degree of consistency found by the triangulation between the result of the questionnaire subscale

4 (Figure 11) and the graphical display of the codification of participants' comments on the online forum, in the interviews, and in the visual charts from the final meeting (Table 10).

Figure 11: result of the questionnaire subscale 4 about the professional development programme

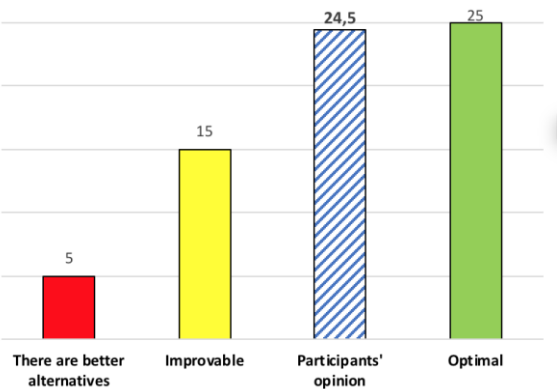


Figure 11 shows the total result of the questionnaire subscale 4, addressing participants' stance on the professional development programme provided in the inter-school intervention. Their opinion is on the right of the neutral point (yellow column, improvable), so participants are positive. As it almost scores the highest possible level, they consider a blended programme combining experiential training and online, ongoing mentoring to be close to optimal.

Table 10: codification of the participants' opinion about the professional development programme

		OPINIONS OF THE 18 PARTICIPANTS																	
Optimal	Visual charts																		
	Online forum																		
	Interviews																		
Improvable	Visual charts																		
	Online forum																		
	Interviews																		
Better alternatives	Visual charts																		
	Online forum																		
	Interviews																		

Table 10 graphically displays the codification of participants' comments on the online forum, in the interviews and also in the visual charts from the final meeting (Appendix 8), devoted to evaluating the effectiveness of the programme after one year of practice (Kirkpatrick & Kirkpatrick, 2006). The overwhelming green colour conveys unanimity: no participant considers the existence of better alternatives, and 90% do not see the necessity for relevant improvements.

4.6.2 SOME SMALL IMPROVEMENTS

The areas for improvement are shown by a more detailed exploration of the consistency between participants' answers to the questionnaire subscale 4 (Table 11), and their comments on the forum, in the interviews, and in the visual charts from the final meeting, confirming the above-mentioned strong optimism.

Table 11: distribution of number of participants answering the subscale 4 items

	Strongly disagree	Disagree	Don't know	Agree	Strongly agree
27. My participation in this project has helped me grow professionally					18
28. A face-to-face workshop is not essential to pilot TBL	18				
29. The initial face-to-face workshop was effective				9	9
30. There is no need for ongoing mentoring to pilot TBL	18				
31. The online community of practice has been effective					18

Item 27 suggests that all participants consider the professional development programme to be highly effective. This is entirely consistent with their comments and arguments in the qualitative strand:

I find TBL very effective and think that I have grown as a teacher implementing it. I hope to keep doing so because I still have a lot to learn (Online forum).

TBL gives me a system. It has help me to channel my desire for change... At my age, it has been a boost of fresh energy. I myself understand better what I'm going to teach... (Interviewee 5).

This project has been the greatest change I have experienced in my professional life (visual chart).

Items 28 and 29 show that all participants consider the initial workshop to be both crucial and effective.

This is also consistent with the qualitative strand; they struggle to find areas for improvement, which refer to measures only addressable after one year of practice:

The initial workshop was excellent. I can't imagine a better induction training for TBL. Experiencing it as a student was illuminating (Interviewee 3)

The only thing I can suggest is to provide new participants with a sample of our application activities covering as many subjects as possible. This is something we couldn't have... (Interviewee 1)

I think it can be improved by using the good and bad examples of application activities collected this year and presented today [in the final meeting] (Visual chart).

Finally, items 30 and 31 show that 100% of participants strongly agree that the ongoing, online mentoring has been both necessary and effective. The qualitative strand confirms this interpretation; only small improvements should be made to the online forum:

Constructive criticism made very sensitively, valuing all of our efforts. Effective, prompt, and decisive response (Visual chart).

The feedback couldn't have been more effective... I missed nothing... If anything, I would have liked to get more comments on my units from other colleagues, but I myself don't feel confident to do so... (Interviewee 5)

In sum, the strong convergence found by data triangulation shows that sixth-form innovators and early adopters are certain about the organisational arrangements necessary to create the climate that will enable them to disseminate TBL across the federation: a blended voluntary professional programme that combines experiential learning and ongoing, online mentoring.

4.7 Summary

As the questionnaire used in the quantitative strand is only validated in terms of content and, like the qualitative methods, possibly biased, a bespoke triangulation method was created to find convergence by coding the data against the research questions. No remarkable inconsistency was found, and the degree of convergence between the qualitative and the quantitative strands is encouraging, suggesting the following conclusions.

- a) Sixth-form innovators' experience of change when piloting TBL is strong and does not appear to differ significantly from that of university teachers. The change towards a more active, learner-centred approach is so dramatic that TBL seems hardly compatible with traditional didactic lecturing.
- b) Participants' commitment to moving to TBL is remarkable. They would like to adopt TBL because it involves a change for the better; TBL is superior to traditional didactic lecturing and very engaging. However, the above-mentioned change is so challenging that the adoption can only be gradual; it entails a significant increase in workload and requires time.
- c) Innovators have positive expectations about the dissemination of TBL across the federation; they are willing to collaborate over time as well as optimistic about both the prospective degree of resistance offered by the school community and the provision of the appropriate institutional support.
- d) Participants consider that this appropriate institutional support would consist of arranging a voluntary teacher professional development programme encompassing both initial, experiential training and ongoing, online mentoring.

5. LIMITATIONS, CONCLUSION, AND DISCUSSION

5.1 Limitations and conclusion

Given the systematic failure of the Spanish school reforms to deliver the competence-led approach recommended by the OECD in the light of PISA, the Federation Steering Committee undertook a multi-step project to develop and deliver an effective strategy for a change in pedagogic culture towards active learning; one that is particularly challenging in the sixth form. The first two steps of this project focused on the design of the strategy. The first one, which I described in my Part 2 assignment, successfully piloted a university teaching method called TBL as a driver for a dramatic shift in my sixth-form philosophy classes, suggesting the suitability of further development by moving from the classroom to the institution. This case study was the second step, exploring the extent to which the institutional promotion of TBL across the federation is a suitable strategy to drive educational change in the sixth form.

The literature review confirmed that TBL has the makings of a driver for a paradigm shift. It also highlighted that a) the 'crux' of successful educational change is the teachers' attitude towards innovative pedagogies (Fullan, 2015, p. 18) and b) the successful 'diffusion of an innovation' always depends on the 16% of staff members who, initially proactive to change, take the lead (Rogers, 2003, p. 50). Consequently, the study focused on the sixth-form teachers already seeking satisfactory alternatives to traditional lecturing; the experience-based opinions of those who, over time, could lead change across the federation by acting as role models, appeared to be the most relevant and reliable piece of evidence obtainable in a one-year inter-school intervention. The inter-school intervention, piloting a one-week TBL unit per term, engaged 18 innovators of 9 subjects, from 12 schools across Spain in a voluntary professional development programme that reached more than 500 sixth formers. The empirical research developed a triangulation method to analyse data gathered from a mixed-method approach that encompassed a bespoke questionnaire, an online forum, 6 interviews, and collaborative visual charts.

The research findings were encouraging due to a) the great scope of the change experienced by participants, b) their commitment to TBL, c) their positive expectations about its dissemination across the federation, and d) their certainty and optimism about the way forward. Participants found that TBL drives a dramatic shift that enters 'the black box of classroom practice' and does not produce mere 'change without reform'

(Cuban, 2013, p. 6). They realised that TBL can be the alternative to unsatisfactory lecturing that they were already seeking and would like to adopt, albeit gradually over time; it is a change for the better, but one that is difficult because it does not appear 'compatible with the existing teaching culture' (Freeman, 2012, p. 161). They considered that piloting TBL is a good opportunity for the rest of the staff to take an 'emotional journey' (Roberson & Franchini, 2014: p. 161): starting to question their teacher-centred, content-led lecturing by experiencing the advantages of an operational active teaching method. What is more, they were convinced that they had already experienced the 'supportive professional climate' (Sahlberg, 2006, p. 284) for that journey to happen: a voluntary teacher professional development programme that combines experiential training and ongoing, online mentoring.

Certainly, limitations throughout the study may have shaped the above-mentioned findings. For example, the scope of the literature review required by the review questions was enormous, particularly that of the field of educational change, which covers a body of knowledge 'so extensive' (Hargreaves et al., 1998, p. 4) that it makes it difficult to ensure the identification of the relevant literature. The research design also had several limitations. First, the one-year nature of the intervention made it necessary to focus on the teachers' perception of change, without the possibility of checking 'the reality of change' (Hanson, 2001, p. 653) in their teaching practices. Second, due to the physical constraints of a decentralised federation, the professional development programme of the inter-school intervention focused on ensuring fidelity to genuine TBL in terms of design rather than in terms of facilitation. By the same token, there is no certainty that the participants' recruitment process, while thorough, succeeded in identifying the 16% of genuine 'innovators' and 'early adopters' (Styron et al., 2015, p. 200) within the federation's sixth-form teaching staff. Third, in terms of method, and despite the efforts to minimise bias, the questionnaire used lacks psychometric validation, and both my commitment to TBL and my inexperience conducting interviews might have impacted the data collection and interpretation. Data analysis was also limited for two reasons: the methods used might not have been sufficiently complementary to ensure that the designed triangulation method, albeit bespoke and focused on the research questions, succeeded in minimising bias; moreover, codification of the qualitative strand, while carefully conducted, involved a degree of personal interpretation.

Nonetheless, and despite all these limitations, the very high degree of convergence between the qualitative and the quantitative strands underlying participants' positive stance towards TBL strongly suggests that **promoting TBL as a driver for educational change in the sixth form is a sound and worthwhile institutional strategy, provided the school federation supports the staff with a voluntary professional development programme encompassing both initial experiential training and ongoing mentoring through an online community of practice.** This encouraging conclusion positions this study in the debates of the field of educational change and of the TBL framework, and the study itself has important implications for both my professional career and the development of the school federation.

5.2 Discussion

5.2.1 THE POSITION WITHIN THE FIELD OF EDUCATIONAL CHANGE

Regarding the field of educational change, this study has multiple implications. First, within the general agreement that top-down policies of school reform have usually failed to deliver real transformation both globally (e.g., Cuban, 2013) and also in Spain (e.g., Monarca & Rappoport, 2013), this study supports recent approaches that successful educational change might be most effectively driven from the bottom up through small-scale initiatives (e.g., Hargreaves & Shirley, 2009), questioning those who are pessimistic about the viability of local initiatives of change (e.g., Leithwood et al., 2002). It also suggests that school autonomy and self-government might be both a great asset for non-state organisations (like this federation) and a possible way forward for state schools, where a rigid organisational system reinforces 'the inertia of the status quo' (San Fabián, 2011, p. 41).

Second, it reverses the usual approach that the transformation of classroom teaching practices is the result of a dramatic top-down shift in pedagogic culture (e.g., Kimonen & Nevalainen, 2005); aligned with the scholars who emphasise the centrality of pedagogy in successful educational change both globally (e.g., Rincón-Gallardo & Elmore, 2012) and in Spain (e.g., Bolívar & Moreno, 2006), it suggests that the implementation of transformative teaching methods might be the key driver, the cause rather than the effect, of a change in culture. What is more, it complements the transformative, albeit only conceptual, frameworks developed by scholars in the field of educational change (e.g., Fullan & Langworthy, 2013) by showing that TBL can be a pedagogy that makes them really operational.

Third, it is in line with the theoretical perspectives that highlight the centrality of institutional commitment and professional growth against the ineffectiveness of external, top-down impositions (e.g., Pyhältö et al., 2011); the provision of a voluntary, blended professional development programme has shown itself to be a very effective tool for the promotion of teachers' commitment to innovation.

Finally, it supports the inclusion of organisational development theory in the design of educational change strategies, as in the case of the University of South Alabama (Styron et al., 2015); the identification of, and the support to, early innovators appears to be an appropriate initial step towards a progressive diffusion of pedagogic innovations.

5.2.2 THE CONTRIBUTIONS TO THE TBL FRAMEWORK

This study contributes to the further development of the TBL framework in several respects. It focuses on the teachers' experience, a perspective ignored by the literature on TBL until very recently, and still under-researched (Kebodeaux et al. 2017). It highlights the lack of a reliable tool for measuring this critical aspect of educational change and lays the foundations for the development of a prospective 'validated measurement' instrument, one of the major limitations in empirical research into TBL (Haidet et al. 2014, p. 133).

In terms of educational stage, it joins the only three existing studies exploring the suitability of genuine TBL before higher education (Kent et al., 2015; Wanzek et al., 2015; Wanzek, Vaughn, et al., 2014) but goes beyond them; it suggests that, from the teachers' perspective, there does not appear to be any significant difference between the suitability of TBL at university and in the sixth form, irrespective of the discipline. In this sense, it addresses the implementation of TBL in 9 subjects, some of them rather unusual for TBL practitioners, reinforcing the few experiences that support the suitability of TBL in social sciences and humanities (Sweet & Michaelsen, 2012).

The study goes beyond the prevalent adoption of TBL by individual teachers and is at the forefront of research into its dissemination at institutional level along with the only two existing university experiences (Styron et al., 2015; Estis, 2017; Remington et al., 2015). In line with them, it suggests that TBL is worth piloting not only as a transformative classroom teaching practice but also as an institutional driver for a

change in pedagogic culture. In contrast to them, it addresses TBL as an essential component of institutional policy at the level of a multi-site and decentralised organisation, an aspect hitherto unexplored. It supports the progressive dissemination undertaken by the University of South Alabama, starting with the 16% of early innovators (Rogers, 2003), and questions the top-down imposition of the University of Michigan. However, it addresses a remarkable limitation in terms of professional development; in identifying the absence of clear teacher development standards, it develops and tests a battery of organizational arrangements that might be helpful for other institutions, whether or not decentralised.

5.2.3 PROFESSIONAL AND INSTITUTIONAL IMPLICATIONS

This study represents a real breakthrough for both myself and the school federation. Professionally, it has allowed me to pioneer the implementation of TBL in Spain, contributing to the growth of a budding European TBL community. Most importantly, in helping me fulfil my institutional responsibilities by developing a new and challenging level of collaboration, it has strongly reinforced my leadership role as the Academic Excellence Coordinator, turning me into an 'innovation champion' (Freeman, 2012, p. 164), a teacher in management positions who leads change by example. Institutionally, its completion has reinforced the autonomy of the federation, addressing a major challenge, such as a change in pedagogic culture, by designing a research-based, innovative strategy. Moreover, its conclusion strongly encourages the federation to harness this autonomy by implementing such an innovative strategy, putting it on the track of leadership in educational change within the Spanish context, where school organisation tends to reinforce inertia and to hinder change. What is more, the intervention undertaken in it has already set in motion the organisational arrangements necessary for such implementation to take place: a thriving, transformative community of practice which has risen from 18 to 40 sixth-form teachers in the academic year 2018-19. One that fosters participants' identification with, and sense of belonging to, a common, albeit multi-site and diverse, school community. The further development of this study, the third step of the above-mentioned institutional project, should make the most of this community, exploring the extent to which this strategy, a priori suitable, is also effective in changing teachers' beliefs and practices.

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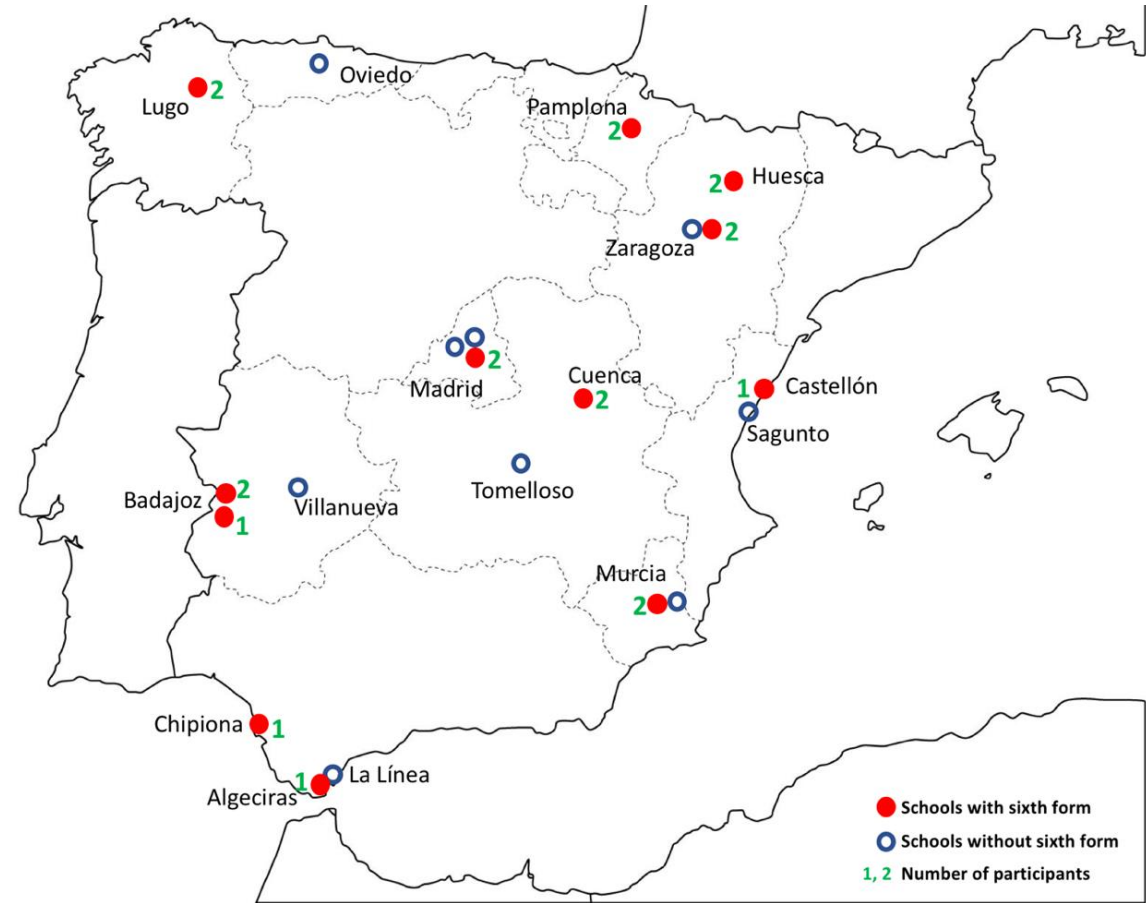
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7. APPENDICES

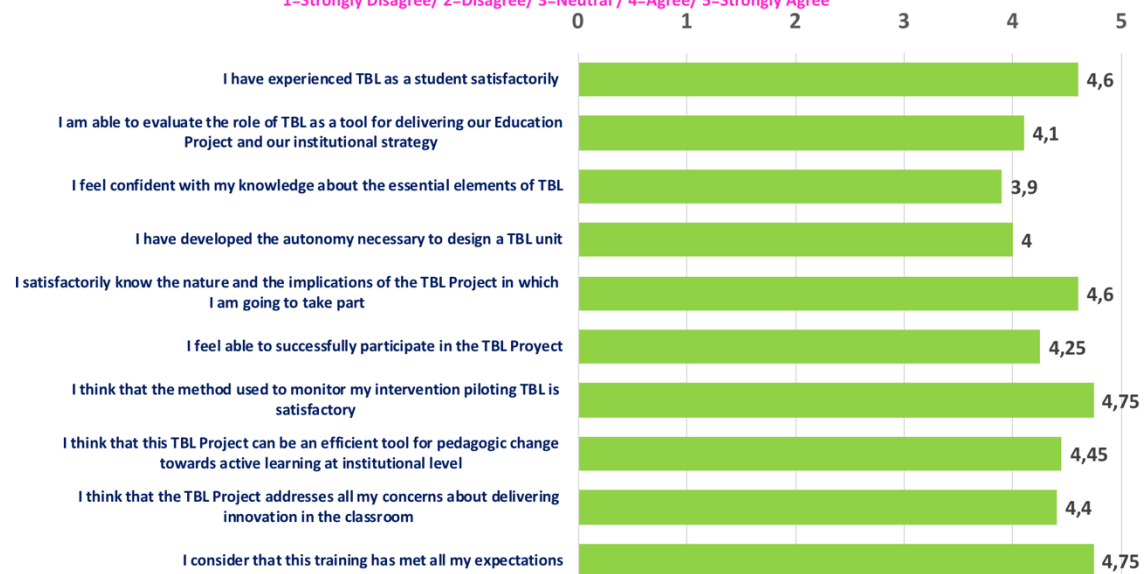
Appendix 1: distribution of participants throughout Spain



Appendix 2: participant evaluation of the face-to-face workshop

Assessment of the 2-day seminar on TBL

1=Strongly Disagree/ 2=Disagree/ 3=Neutral / 4=Agree/ 5=Strongly Agree





TBL PROJECT

TERM 1

1. STUDENTS' PERCEPTION

- 1.1) students welcome TBL (91%) vs students resist TBL (9%)
- 1.2) Students welcome TBL (91%): qualitative & quantitative data
 - 1.2.1) Positive aspects
 - 1.2.2) Areas for improvement
- 1.3) Students resist TBL (9%): possible causes

2. TEACHERS' PERCEPTION

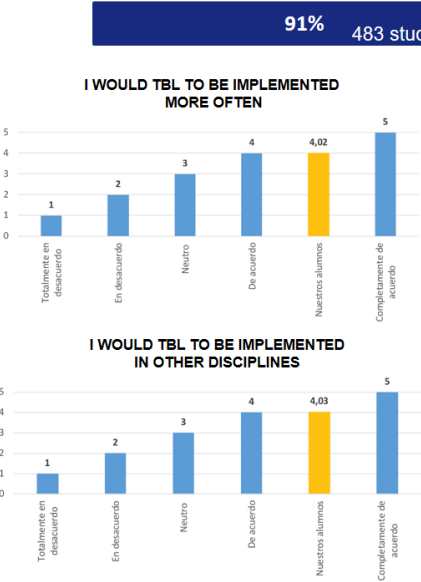
- 2.1) Participants' perception
- 2.2) Oscar's evaluation



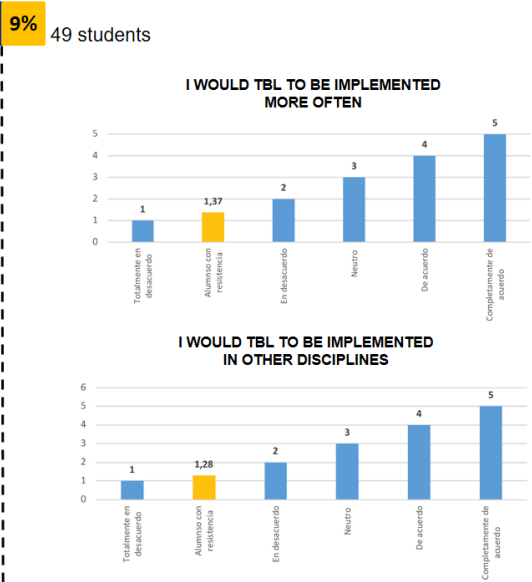
1. STUDENTS' PERCEPTION

Proyecto TBL

1.1 STUDENTS WELCOME TBL vs STUDENTS RESIST TBL



91% of students TBL: they clearly say that they would welcome other teachers piloting TBL

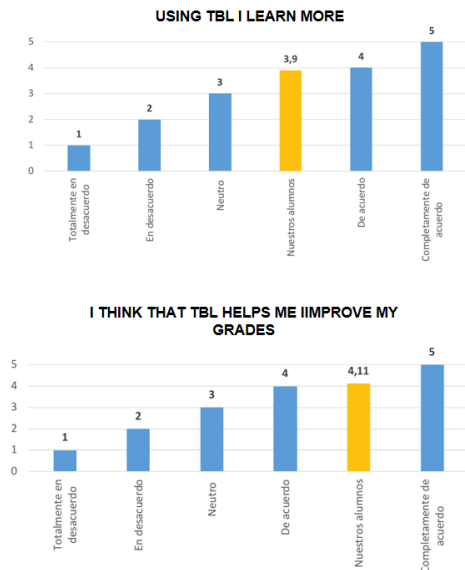


9% of students clearly resist TBL and would dislike further implementations

1. STUDENTS' PERCEPTION

Proyecto TBL

1.2.1 STUDENTS WELCOME TBL (91%, 483 students): positive comments



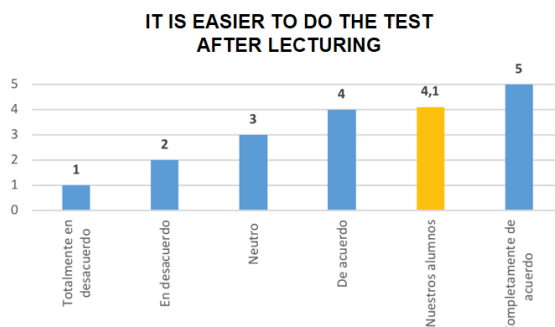
SOMME COMMENTS

- It helps me remember content more easily in the exams.
- My experience with TBL is very positive because we learn from each other.
- I think that it is a perfect way to make learning more enjoyable
- Good way of learning and funner. We learn more working in teams.
- It is a good method because it forces us to work every day at home and make the most of classroom time. I like it.
- I like it very much. We learn more and are more focused than in traditional classes.
- It is easier to remember theory applied in application activities and is a good way to foster teamwork...
- Nice experience, fun and productive
- You remember better what you have learned working in teams. It helps you for exams.
- TBL activities are appropriate. They help you understand.
- I like this method. We help each other and have fun.
- I like it very much. We learn more and are more focused.
- Very fun.
- I love working this way, Learning from each other and having fun.

1. STUDENTS' PERCEPTION

Proyecto TBL

1.2.2 STUDENTS WELCOME TBL(91%, 483 alumnos): areas for improvement



THE MAJOR BARRIERS

Creating bespoke materials. Apparently, the most difficult aspect for students embracing TBL is to face theory without lecturing. The solution should be a good selection and adaptation of materials to the time required from students at home.

Dates: since we are piloting TBL only a week per term, it is critical To find the appropriate week avoiding dates overcharged with Ordinary exams. .

SOME "BUTS"

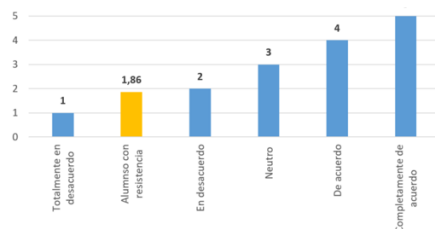
- I like, but the impossibility for teacher to lecturing before the exam is inappropriate.
- I liked TBL but would prefer to have some lecturings before the exam.
- TBL is a good way of Learning, but I really miss some good lectures to sit the exam with more selfconfidence.
- There is always somebody trying to boss around in the team.
- Good experience, but it should be implemented when there are no exams of other subjects.
- We should do TBL in a week with less exams.

1. STUDENTS' PERCEPTION

Proyecto TBL

1.3 STUDENTS RESISTING TBL (9%: 49 students)

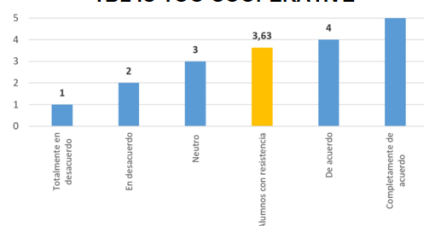
USING TBL I THINK I LEARN MORE



SAMPLE OF COMMENTS

- ... these new practices are still Green and should not be piloted in Baccalaureate, when students need to get good grades by regurgitating content like the system expects from us.
- Teamwork has not been that bad, but theory was too complicated to be understood and learned without lectures.
- I think that teams were not balanced. There are some people who cannot be in the same team.
- I strongly dislike this methodology, I have not learned anything new. I don't like working in teams because it prevents me from expressing all what I know. I feel better working individually.
- I don't like working in teams. Last academic year I failed to pass a subject because I did not want to work in teams.

TBL IS TOO COOPERATIVE



POSSIBLE FACTORS IMPACTING THE OPPOSITION

It is natural that some students as well as some teachers resist active learning. We must try to understand their reasons although in some cases there is little we can do to persuade them.

- 1.- Resistance may be shown to cooperative learning rather than to TBL. Shyness can be an important factor. We should be attentive and ready to help shy students.
- 2.- Some students as well as some teachers keep thinking that learning is just acquiring content in order to repeat it in exams. That is our challenge: to seduce them that that is wrong.
- 3.- Some students particularly obsessed about grades consider that TBL penalise them. We should impress on them how positive TBL is for them and their grades. The problem is that self-confidence should not depend on the ability to repeat content.
- 4.- The difficulty to study without lectures can be compensated by good and tailor-made materials.



2. TEACHERS' PERCEPTION

Proyecto TBL

POSITIVE ASPECTS: TBL appears to meet the expectations

- All teachers who gave their feedback (15) consider the TBL module as **a positive or very positive experience**
- All of them agree that TBL is motivating and engaging, and that students learn more with it.
- TBL has served to improve the grades of the majority of students.
- TBL delivers cooperative learning and peer evaluation works satisfactorily.

LESSONS LEARNED

- There are always some students who resist active learning (the reasons can be varied but in some cases this reluctance may be beyond our power).
- Application activities are difficult to create and are time-consuming. However, they appear to pay off over time.
- Timing is complicated: some activities have been much more productive than expected and some teachers run out of time.
- The moment selected to implement the TBL module has not been appropriate in some cases due to the coincidence with exams.
- It might be appropriate to start in lower instead of upper sixth form classes for students to have time to become familiar with TBL.

TEACHERS' EVALUATION

- Teachers' commitment and involvement has been excellent (19 teachers have implemented the TBL module).
- It should not come as a surprise that the major difficulty has been the design of significant application activities. In this sense, it would be useful to remember that
 - a) the activity must address a situation that is meaningful for students, one that they can encounter in their lives;
 - b) The question must also be significant, have students apply theory to prefer a course of action in the face of a problem of their everyday life. It is not about identifying the right answer but about preferring a particular course of action.
- In the second term I will try to foster more interaction between teachers on the forum, highlighting how you can share some of your activities and modules; some of you teach the same subject (philosophy, biology, history, economics...).

Appendix 4: interview questions

Teacher Interview Protocol (translated from Spanish into English)

Research questions (RQ):

- How transformative do sixth-form innovators consider TBL to be?*
- How willing and able would they be to adopt TBL?*
- How suitable do they consider the dissemination of TBL across the school to be?*
- What would the best organisational arrangements to achieve that be?*

Essential interview questions	RQ			
	a	b	c	d
What has your experience been like as an innovator piloting TBL?		X	X	
Could you give me an example of a positive experience piloting TBL?	X	X		
From your experience piloting TBL, what would you say are the positive aspects of TBL?	X	X		
Could you give me an example of a negative experience piloting TBL?	X	X		
From your experience piloting TBL, what would you say are the negative aspects of TBL?	X	X		
To what extent has TBL helped you change your beliefs about how students best learn?	X			
How different is TBL from your usual teaching practice?	X			
Will TBL be usual, complementary or unusual in your teaching practice?			X	
How prepared do you feel you are to adopt TBL? Why?		X		
To what extent would you be willing to adopt TBL? Why?		X		
How compatible is TBL with the existing school teaching culture for you and your colleagues?	X	X	X	
To what extent can TBL be used to change teachers' beliefs about education?		X	X	
How feasible do you consider for other teachers at your school to pilot TBL?			X	
To what extent is it worth to involve another cohort of 20 teachers in piloting TBL?			X	
How feasible do you consider the adoption of TBL as the main teaching practice at your school?			X	
How do you see yourself contributing to the possible adoption of TBL in the sixth form?			X	
To what extent has this project helped you grow professionally?				X
Have you identified any learning gap?				X
After the whole process, how do you evaluate the initial workshop?				X
Would you suggest some changes on the online community for a prospective new cohort?				X
How could a prospective new participant feel better supported?				X
Do you have any additional comments to make?	X	X	X	X

Appendix 5: sample of expert contribution to content validation of a prospective questionnaire

Research project into TBL as a driver for pedagogic transformation at institutional level

Development of a validated tool for evaluating the teachers' experience with TBL

Content validation

Please, do assess the content validity of this questionnaire aimed at evaluating the teachers' experience with TBL by rating the subscales and the items, and providing additional comments if appropriate

SUBSCALES

SUBSCALES (Aspects that reflect the teachers' experience with TBL)	Irrelevant (1 point)	Relevant (2 points)	Very relevant (3 points)	COMMENTS
STUDENT ACCOUNTABILITY SUBSCALE This subscale assesses the teachers' perception of the effectiveness of TBL in terms of making students both come to class prepared and contribute to the team's success.			3	
STUDENT LEARNING SUBSCALE This subscale measures the extent to which teachers consider TBL is superior to traditional didactic lecturing in terms of student learning.			3	
STUDENT ENGAGEMENT & MOTIVATION SUBSCALE This subscale measures the teachers' perceptions about the effectiveness of TBL in engaging and motivating students.			3	
PEDAGOGIC CHANGE SUBSCALE This subscale assesses the degree to which teachers consider TBL as an effective driver for a major pedagogical change.			3	
EASE OF IMPLEMENTATION SUBSCALE This subscale assesses the degree of difficulty that teachers encounter when piloting TBL and what they expect in a prospective adoption of TBL.			3	
CATALYST FOR INSTITUTIONAL CHANGE SUBSCALE This subscale evaluates teacher perceptions about the suitability of TBL as a driver for pedagogic change at institutional level (department, faculty, university...)			3	This is quite similar to pedagogic change subscale so ensure this is intentional change in this scale items compared to the one above.
Are there any other aspects to be considered? If so, which ones?				

ITEMS

In an attempt to avoid bias, the questionnaire includes items expressing advantages and disadvantages.
Items in yellow express disadvantages and will have reverse score when using the Likert scale of five points

STUDENTS' ACCOUNTABILITY SUBSCALE

This subscale assesses the teachers' perception of the effectiveness of TBL in terms of making students both come to class prepared and contribute to the team success.

ITEMS	Not relevant (1 point)	Relevant but needs some revision (2 points)	Relevant but needs minor revision (3 points)	Very relevant (4 points)	COMMENTS (for instance, if revision is needed)
1. Traditional lecture is more effective than TBL in making students come to class prepared			3		A traditional <u>didactic</u> lecture is more effective than TBL in making students come to class prepared
2. TBL significantly reinforces the students' predisposition to come to class prepared			3		TBL motivates students to come to class prepared
3. TBL helps teachers make students more accountable for their individual work			3		Reword, quite awkward to read. TBL holds students accountable for their individual work
4. TBL is inefficient in improving the students' contribution to the team's learning			3		TBL is inefficient in improving students' contributions to the team's learning
5. TBL allows teachers to impress upon students that their contribution to the team is important			3		If this is about student accountability, then I don't think the teacher should feature in the question
6. TBL helps teachers make students more accountable for their team member's learning			3		If this is about student accountability, then I don't think the teacher should feature in the question
Are there any other items to be considered? If so, which ones?	TBL encourages student accountability for peer evaluation or peer learning whichever expression you prefer				

STUDENT LEARNING SUBSCALE

This subscale measures the extent to which teachers consider that TBL is superior to traditional lecturing in terms of students' Learning.

ITEMS	Not relevant (1 point)	Relevant but needs some revision (2 points)	Relevant but needs minor revision (3 points)	Very relevant (4 points)	COMMENTS (for instance, if revision is needed)
7. Having students learn to apply content and concepts to real situations is easier through TBL than through traditional lecturing				4	
8. Students learn less theoretical content implementing TBL than using traditional lecturing				4	
9. Students' learning is deeper and longer lasting through traditional lecturing than through TBL				4	
10. TBL is very efficient in helping students develop the key skills		2			TBL is very efficient in helping students develop the key skills in what? It depends what the key skills are that are written in order to know if this is relevant or not
11. Students who learn through traditional lecturing are better prepared to do exams than those using TBL			3		Students who learn through traditional lecturing are better prepared to do exams than those learning through TBL
12. TBL allows teachers to witness and refine the students' thinking process		2			You can't see someone thinking, you can only hear their explanations and rationales for specific answers. Agree that the teacher can refine or refocus their thinking
13. TBL gives teachers more opportunities than traditional lecturing to provide students with useful and timely feedback				4	
Are there any other items to be considered? If so, which ones?	TBL enables teachers to hear students' conceptual understanding of key concepts and principles more readily than traditional learning				

PEDAGOGIC CHANGE SUBSCALE

This subscale assesses the degree to which teachers consider TBL as an effective driver for a major change in pedagogy

ITEMS	Not relevant (1 point)	Relevant but needs some revision (2 points)	Relevant but needs minor revision (3 points)	Very relevant (4 points)	COMMENTS (for instance, if revision is needed)
14. TBL leads teachers to focus on the development of skills and talents rather than on covering content			3		TBL leads teachers to focus on the development of skills and talents/attributes or behaviours rather than on covering content alone
15. TBL adopts a teacher-centred rather than a student-centred approach			3		TBL adopts a teacher-centred rather than a student-centred learning approach
16. Adopting TBL involves considering students as a set of competencies to be developed through practice rather than as 'empty vessels to be filled with knowledge'.		2			Adopting TBL involves considering student learning as a process involving developing a set of competencies through practice rather than one involving the filling of 'empty vessels with knowledge'. Or Adopting TBL involves considering student outcomes as a ...etc
17. Adopting TBL entails that student learning consists of acquiring content by listening to the teacher rather than of actively building their own knowledge			3		Adopting TBL requires student learning to focus on acquiring content rather ...etc
18. By implementing TBL I am a guide and a facilitator rather than an instructor			3		Minor editing
19. I think that TBL represents a major change in my teaching practice				4	
20. Implementing TBL requires a significant change in the grading system			3		
21. I think that TBL is a change for the better				4	
Are there any other items to be considered? If so, which ones?					

STUDENT ENGAGEMENT AND MOTIVATION SUBSCALE

This subscale measures the teachers' perception about the effectiveness of TBL in engaging and motivating students

ITEMS	Not relevant (1 point)	Relevant but needs some revision (2 points)	Relevant but needs minor revision (3 points)	Very relevant (4 points)	COMMENTS (for instance, if revision is needed)
22. In TBL, students get distracted easily				4	
23. Students enjoy lessons and have fun in TBL			3		Students enjoy and have fun in TBL classes
24. Students get bored more easily in TBL classes than in traditional didactic lecturing			3		
25. TBL clearly increases student motivation and their predisposition to participate in class			3		
26. TBL ensures that students work more actively than with traditional pedagogies, making the most of classroom time			3		
Are there any other items to be considered? If so, which ones?	TBL as a form of active learning engages and motivates students in classes				

EASE OF IMPLEMENTATION SUBSCALE

This subscale assesses the degree of difficulty that teachers encounter when piloting TBL and the one they expect in a prospective adoption of TBL

ITEMS	Not relevant (1 point)	Relevant but needs some revision (2 points)	Relevant but needs minor revision (3 points)	Very relevant (4 points)	COMMENTS (for instance, if revision is needed)
27. The degree of initial training required by an appropriate implementation of TBL is very demanding				4	
28. Implementing TBL appropriately requires a great deal of <u>professional development by the educator</u>		2			
29. Designing TBL units takes a lot of effort and is time- consuming <u>to prepare prior to class</u>		2			
30. Designing appropriate application activities is easy			3		
31. Over time, the extra effort made in adopting TBL will pay off <u>for educators</u>			3		
32. Classroom management is easy and convenient when using TBL				4	
33. I am motivated to change to TBL				4	
Are there any other items to be considered? If so, which ones?	<u>Unlike didactic lecturing, TBL requires a lot of preparation prior to class</u>				

Research project into TBL as a driver for pedagogic transformation at institutional level
Development of a validated tool for evaluating the teachers' experience with TBL
Content validation

CATALYST FOR INSTITUTIONAL CHANGE SUBSCALE

This subscale evaluates the teachers' perception about the suitability of TBL as a driver for a paradigm shift at institutional level (school, department, faculty...)

ITEMS	Not relevant (1 point)	Relevant but needs some revision (2 points)	Relevant but needs minor revision (3 points)	Very relevant (4 points)	COMMENTS (for instance, if revision is needed)
34. <u>My</u> department/faculty/school teaching staff would be able to adopt TBL as pedagogic framework			3		
35. The initial training/ <u>professional development</u> required to implement TBL at <u>my</u> department/faculty/school level would be too demanding or would <u>take</u> too much time			3		
36. <u>During the</u> next academic year I would be able to efficiently help other colleagues implement TBL			3		
37. <u>Teaching staff in the Baccalaureate of my</u> department/faculty/school in would offer strong resistance to <u>implementing</u> TBL, making it difficult for the school to use it as a driver for pedagogic change			3		
38. I think that students and families would offer strong reluctance to the adoption of TBL at school level.				4	
Are there any other items to be considered? If so, which ones?	<u>If I had institutional support, I would adopt TBL in my school/faculty/department</u>				

Appendix 6: initial battery of items for a bespoke questionnaire

Changes derived from content and linguistic validation

Yellow background: items with reverse score

In black: 8 items with no revision

In blue: 5 subscales and 21 items with minor revision

In red: 1 subscale and 8 items with some revision

In bold red: 5 new items

STUDENT ACCOUNTABILITY

This aspect assesses the teachers' perception of the effectiveness of TBL in developing accountability to the team in terms of motivating students to both come to class prepared and contribute to the team success



1. Traditional didactic lectures are more effective than TBL in making students come to class prepared
2 TBL significantly motivates students to come to class prepared
3. TBL makes students more accountable for their individual work
4. TBL is ineffective in improving students' contributions to the team's learning
5. TBL motivates students to contribute to team learning
6. TBL make students more accountable for their team's learning
7. Peer evaluation develops the accountability of students to their teams

STUDENT LEARNING

This aspect measures the perceived efficacy of TBL in terms of students' learning when compared to a traditional didactic lecture

8. Having students learn to apply content and concepts to real situations is easier through TBL than through traditional lecturing
9. Students learn less theoretical content implementing TBL than using traditional lecturing
10. Students' learning is deeper and longer lasting through traditional lecturing than through TBL
11. Students who learn through traditional lecturing are better prepared for their exams than those learning through TBL
12. In TBL, the students' thinking process can be refined and refocused by the teacher
13. TBL gives teachers more opportunities than traditional lecturing to provide students with useful and timely feedback
14. In a TBL class, effective peer learning takes place
15. TBL enables teachers to check students' conceptual understanding of key concepts more readily than traditional learning

STUDENT ENGAGEMENT AND MOTIVATION

This aspect measures the teachers' perception about the effectiveness of TBL in motivating students to engage in classroom activities

16. In TBL, students get distracted easily
17. Students enjoy and have fun in TBL classes
18. Students get bored more easily in TBL classes than in traditional didactic lecturing
19. TBL motivates students to participate in classes
20. TBL ensures that students work more actively than with traditional pedagogies, making the most of classroom time

PEDAGOGIC CHANGE

This aspect assesses the degree to which teachers consider TBL as an effective driver for a change in pedagogic culture

21. TBL leads teachers to focus on the development of skills and capabilities rather than just on covering content
22. TBL adopts a teacher-centred rather than a student-centred learning approach
23. Adopting TBL involves considering student learning as a process involving developing a set of competencies through practice rather than one involving the filling of 'empty vessels' with knowledge
24. Adopting TBL requires student learning to focus on content acquisition by listening to the teacher rather than of actively building their own knowledge
25. By implementing TBL I am a guide and a facilitator rather than an instructor
26. TBL represents a major change in my teaching practice
27. Implementing TBL requires a significant change in the grading system
28. I think that TBL is a change for the better

EASE OF IMPLEMENTATION

This aspect assesses the degree of difficulty that teachers encounter when first using TBL and what they expect in a prospective adoption of TBL

29. The degree of initial training required by an appropriate implementation of TBL is very demanding
30. Implementing TBL appropriately requires a great deal of expertise and professional development by the educator
31. Designing TBL units takes a lot of effort and requires a lot of preparation prior to class
32. Designing appropriate application activities is easy
33. Over time, the extra effort made in adopting TBL will pay off for educators
34. Classroom management is easy when using TBL
35. I am motivated to change other classes/courses to TBL
36. Implementing TBL took a lot longer than I expected

CATALYST FOR INSTITUTIONAL CHANGE

This aspect evaluates the teachers' perception about the suitability of TBL as a driver for pedagogic change beyond individual modules/courses (at department, faculty, university, school or organisational level)

37. My department/faculty/school teaching staff would be able to adopt TBL as pedagogic framework
38. The initial training required to implement TBL at my department/faculty/school level would be too demanding or would take too much time
39. During the next academic year I would be able to effectively help other colleagues implement TBL
40. Teaching staff of my department/faculty/school would offer strong resistance to implementing TBL, making it difficult to use it as a driver for pedagogic change
41. There would be strong resistance from students and their families to the adoption of TBL at department/faculty/school level.
42. If I had institutional support, I would adopt TBL in my school/faculty/department

Reverse score (5,4,3,2,1) items 1, 4, 9, 10, 11, 16, 18, 22, 24, 29, 30, 31, 36, 38, 40 y 41.

Appendix 7: bespoke questionnaire for this case study

BESPOKE QUESTIONNAIRE

Scale for all the items:

1=Strongly Disagree

2=Disagree

3=Neutral (neither disagree nor agree)

4=Agree

5=Strongly Agree

Yellow background: items with reverse score

SUBSCALE 1: TRANSFORMATIVE POTENTIAL (low potential / great potential)

This subscale assesses the teachers' perception about the effectiveness of TBL in driving change in pedagogic culture towards active learning

1. Having students learn to apply content and concepts to real situations is easier through TBL than through traditional lecturing	1	2	3	4	5
2. Students' learning is deeper and longer lasting through traditional lecturing than through TBL	1	2	3	4	5
3. In TBL, the students' thinking process can be refined and refocused by the teacher	1	2	3	4	5
4. TBL leads teachers to focus on the development of skills and capabilities rather than just on covering content	1	2	3	4	5
5. Adopting TBL requires student learning to focus on content acquisition by listening to the teacher rather than of actively building their own knowledge	1	2	3	4	5
6. By implementing TBL I am a guide and a facilitator rather than an instructor	1	2	3	4	5
7. TBL represents a major change in my teaching practice	1	2	3	4	5
8. Peer evaluation develops the accountability of students to their teams	1	2	3	4	5
9. In a TBL class, effective peer learning takes place	1	2	3	4	5

SUBSCALE 2: ADOPTION WILLINGNESS (great reluctance / great willingness)

This subscale measures the innovators' willingness to adopt TBL over time

10. Traditional didactic lectures are more effective than TBL in making students come to class prepared	1	2	3	4	5
11. TBL gives teachers more opportunities than traditional lecturing to provide students with useful and timely feedback	1	2	3	4	5
12. TBL enables teachers to check students' conceptual understanding of key concepts more readily than traditional learning	1	2	3	4	5
13. TBL ensures that students work more actively than with traditional pedagogies, making the most of classroom time	1	2	3	4	5
14. I think that TBL is a change for the better	1	2	3	4	5
15. Implementing TBL appropriately requires a great deal of expertise and professional development by the educator	1	2	3	4	5
16. Designing TBL units takes a lot of effort and requires a lot of preparation prior to class	1	2	3	4	5
17. Designing appropriate application activities is easy	1	2	3	4	5
18. Over time, the extra effort made in adopting TBL will pay off for educators	1	2	3	4	5
19. I am motivated to change other classes/courses to TBL	1	2	3	4	5
20. Implementing TBL took a lot longer than I expected	1	2	3	4	5

SUBSCALE 3: DISSEMINATION FEASIBILITY (unfeasible / highly feasible)

This subscale evaluates the innovators' perception about the feasibility of the dissemination of TBL at school level

21. My school teaching staff would be able to adopt TBL as pedagogic framework	1	2	3	4	5
22. The initial training required to implement TBL at my school level would be too demanding or would take too much time	1	2	3	4	5
23. During the next academic year I would be able to effectively help other colleagues implement TBL	1	2	3	4	5
24. Teaching staff of my school would offer strong resistance to implementing TBL, making it difficult to use it as a driver for pedagogic change	1	2	3	4	5
25. There would be strong resistance from students and their families to the adoption of TBL at school level.	1	2	3	4	5
26. If teachers had institutional support, they would adopt TBL in my school	1	2	3	4	5

SUBSCALE 4: ORGANISATIONAL ARRANGEMENTS (unsuitable / optimal)

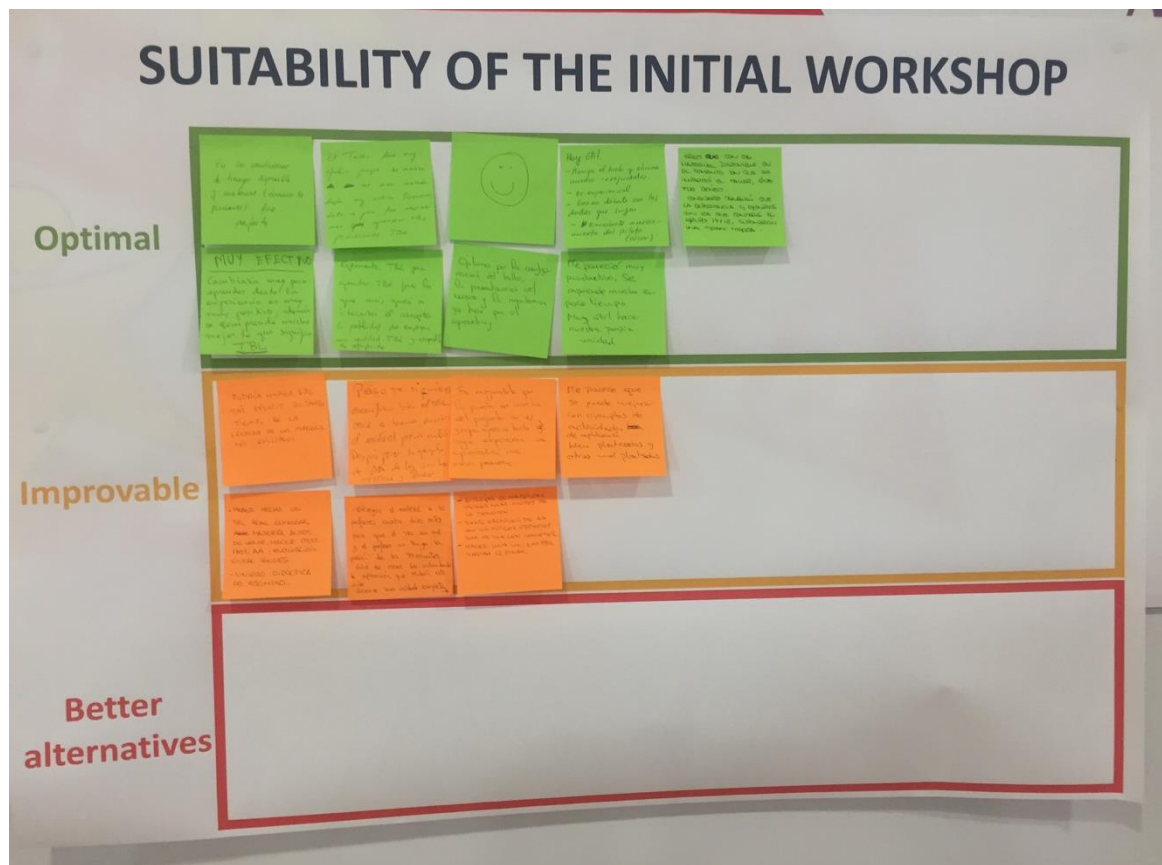
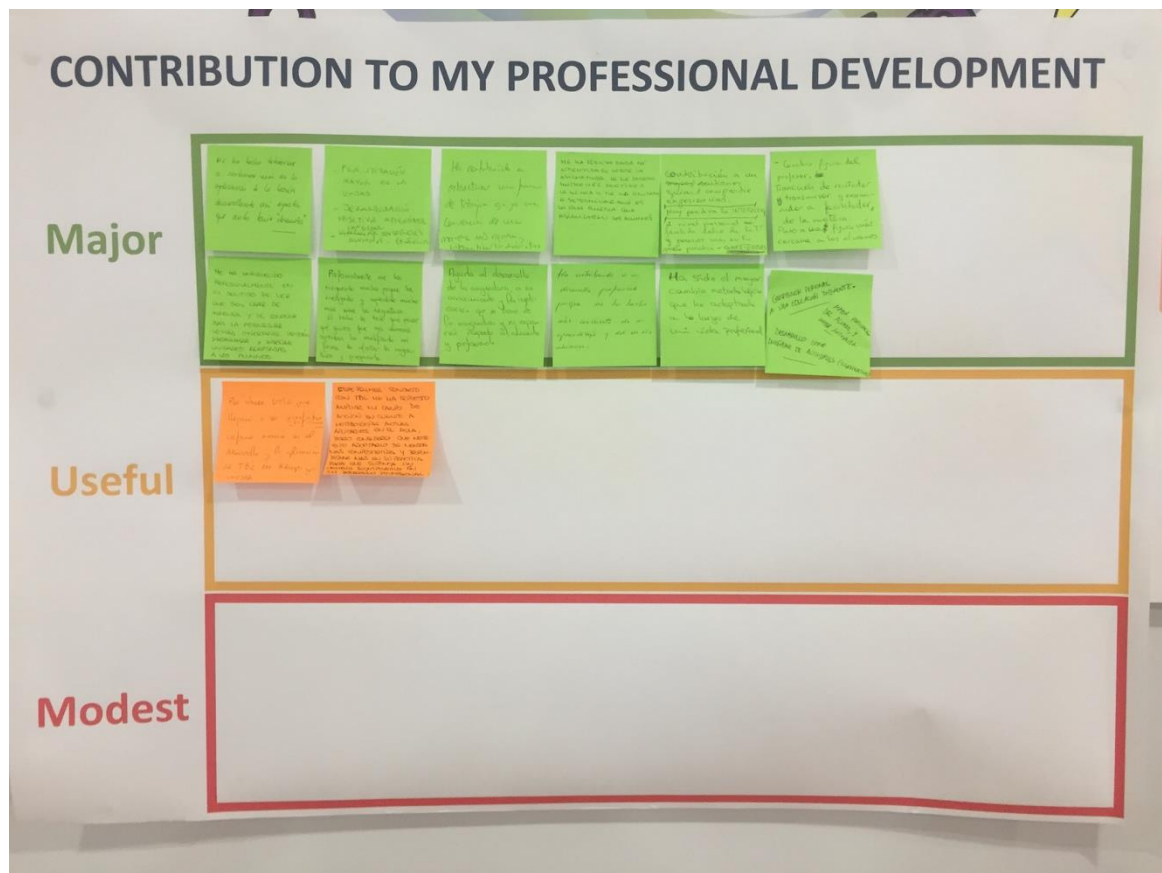
This subscale evaluates the innovators' perception about the suitability of the organisational arrangements made for the trial of TBL

27. My participation in this project has helped me grow professionally	1	2	3	4	5
28. A face-to-face workshop is not essential to pilot TBL	1	2	3	4	5
29. The initial face-to-face workshop was effective	1	2	3	4	5
30. There is no need for ongoing mentoring to pilot TBL	1	2	3	4	5
31. The online community of practice has been effective	1	2	3	4	5
Please, do not hesitate to comment anything you consider appropriate about your experience with TBL					

Directions for scoring the 31 items of the assessment instrument

- Reverse score (5,4,3,2,1) items 2, 5, 10, 15, 16, 20, 22, 24, 25, 28, and 30.
- Sum each scale and the total scale for 1, 2, 3.
- Result interpretation:
 - **Subscale 1: transformative potential**
 - Possible scores range 9 – 45
 - 27 is neutral and shows that the potential of TBL as a driver for a change in culture is not particularly relevant
 - A higher score than 27 indicates that TBL is perceived as a good driver for a change in culture towards active learning
 - **Subscale 2: adoption willingness**
 - Possible scores range 11 – 55
 - 33 is neutral and shows indecision
 - A higher score than 33 indicates that innovators are committed to adopt TBL
 - **Subscale 3: dissemination feasibility**
 - Possible scores range 6 – 30
 - 18 is neutral and shows uncertainty
 - A higher score than 15 indicates that innovators consider TBL to be a suitable driver for educational change at school level
 - **Total scale (1+2+3)**
 - Possible scores range 26 – 130
 - 78 is neutral and shows uncertainty
 - A higher score than 78 indicates that innovators consider the institutional promotion of TBL as a driver for educational change to be suitable
 - **Subscale 4: organisational arrangements**
 - Possible scores range 5 – 25
 - 15 is neutral and shows uncertainty
 - A higher score than 15 indicates that innovators consider the organisational arrangements made for the project to be effective.

Appendix 8: visual charts

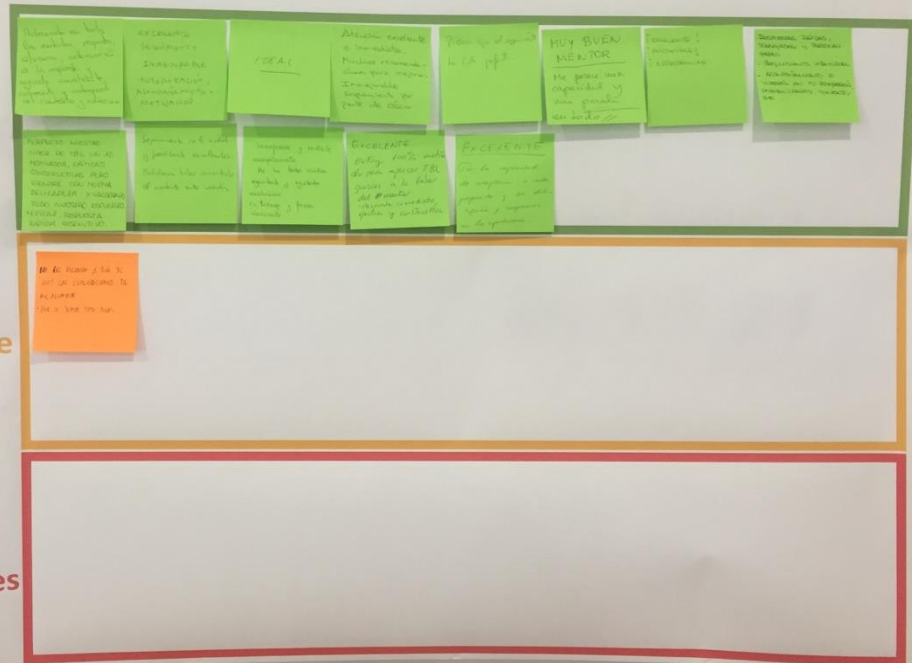


SUITABILITY OF THE MENTORING PROCESS

Optimal

Improvable

Better alternatives



Appendix 9: ethical approval (a change of research title was approved in June 2018)

Dear Oscar,

Title: Driving Active Learning in the Sixth Form: An Exploration of the Potential of Team-Based Learning (TBL) for Educational Change at Institutional Level

The above application (reference number ED-CIA-17-045) has been considered on behalf of the Departmental Research Ethics Committee (DREC) in accordance with the procedures laid down by the University for ethical 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/Inform/research/questions/reporting_child_abuse_wda74908.html

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.

Appendix 10: consent letters

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

Director Professor Jo-Anne Baird



15 December 2017

Dear [redacted],

As Educational Excellence Coordinator of [redacted] leading the delivery of the recently revised Institutional Education Project, I am writing to enquire about conducting research in some schools of our federation this academic year.

As you know, I am reading for the Master's in Learning and Teaching at Oxford University, supervised by Dr Nigel Fancourt. In my final research project *Driving educational change in the sixth form: A case study of Team-Based Learning at school federation level*, I will explore the extent to which an innovative pedagogic framework called TBL is suitable to promote the shift towards active learning that we are seeking.

By supporting this project, the school federation will contribute significantly to the delivery of its education project in various respects. First and foremost, it will assist the Direction Committee in their strategic decision-making about the institutional promotion of a shared driver for active learning in the sixth form. Second, it will reinforce both the existing ties between schools and the teachers' sense of belonging to a greater organisation, fostering a thriving educational community. Finally, it may sow the seeds of a prospective institutional innovation department devoted to exploring new pedagogic approaches and to creating transformative learning environments.

I hope to conduct this research between December 2017 and September 2018. I would gather data from both the students and the teachers' perspective through validated questionnaires, an online forum on the institutional VLE, a plenary meeting, and teacher interviews.

Oxford University has strict ethical procedures on conducting research, consistent with current British Educational Research Association guidelines. Therefore, your formal consent as the Executive Secretary of FEC is necessary, as well as the one of the head teachers of the schools participating in this project. The University also recognises, however, that my study is a piece of practitioner research, and that schools already operate with the highest ethical standards so that formal consent of teachers and pupils is unnecessary. However, throughout the research teachers will be able to refuse to participate in any research activities at any time.

All participants, including students, teachers and schools, would be made anonymous in all research reports. The data collected would be kept strictly confidential, available only to my supervisor (nigel.fancourt@education.ox.ac.uk) and me, and only used for academic purposes. It will be kept for as long as it has academic value.

If you are happy for me to proceed with this study, please confirm that using the attached reply form. If you have any concerns or need more information about what is involved, please contact me or my supervisor. Further, if you have any questions about this ethics process at any time, please contact the chair of the department's research ethics committee, though: research.office@education.ox.ac.uk

I look forward to hearing from you.



Educational Excellence Coordinator

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION

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general.enquiries@education.ox.ac.uk www.education.ox.ac.uk

Director Professor Jo-Anne Baird



[REDACTED]
15 December 2017

Dear [REDACTED]

As Educational Excellence Coordinator of [REDACTED] leading the delivery of the recently revised Institutional Education Project, I am writing to enquire about conducting research in your school this academic year.

As you know, I am reading for the Master's in Learning and Teaching at Oxford University, supervised by Dr Nigel Fancourt. In my final research project *Driving educational change in the sixth form: A case study of Team-Based Learning at school federation level*, I will explore the extent to which an innovative pedagogic framework called TBL is suitable to promote the shift towards active learning that FEC is seeking.

By participating in this project, the school will contribute significantly to the delivery of its education project in various respects. First and foremost, it will promote the transformation of the sixth form pedagogy towards active learning. Second, it will reinforce the teachers' sense of belonging to [REDACTED], fostering a thriving educational community. Finally, it may sow the seeds of a school culture intended to create transformative learning environments.

I hope to conduct this research between November 2017 and September 2018. I would gather data from both the students and the teachers through validated questionnaires, an online forum on the institutional VLE, a plenary meeting and teacher interviews.

Oxford University has strict ethical procedures on conducting ethical research, consistent with current British Educational Research Association guidelines. The University also recognises, however, that my study is a piece of practitioner research, and that schools already operate with the highest ethical standards. Therefore, only your formal consent is necessary, and not that of teachers and pupils. However, throughout the research, teachers will be able to refuse to participate in any research activities at any time.

All participants, including students, teachers and school, would be made anonymous in all research reports. The data collected would be kept strictly confidential, available only to my supervisor (nigel.fancourt@education.ox.ac.uk) and me, and only used for academic purposes. It will be kept for as long as it has academic value.

If you are happy for me to proceed with this study, please confirm that using the attached reply form. If you have any concerns or need more information about what is involved, please contact me or my supervisor. Further, if you have any questions about this ethics process at any time, please contact the chair of the department's research ethics committee, though: research.office@education.ox.ac.uk

I look forward to hearing from you.

Yours sincerely,

[REDACTED]

Educational Excellence Coordinator