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Climates of trust, innovation, and research use in fostering evidence-informed practice in French schools

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ABSTRACT

In France as elsewhere, various arguments suggest that evidence-informed practice (EIP) in education may positively impact student outcomes. However, while these arguments are beginning to mature in countries such as England, uptake of EIP theories in the French context is still nascent. The study presented in this paper seeks to address this knowledge gap. Findings suggest that French school staff generally believe that research evidence could inform educational practices as well as school organization at large. A trusting environment was positively associated with positive perceptions of EIP, but it is relatively less important than a school climate that encourages and supports research use. An interesting challenge for school leaders is how to establish cultures of research use and of innovation.

Introduction

In France and abroad, the desire to support educational policies on the basis of research evidence has increased in recent years. This evolution can be explained by the growing interest of policymakers to base their decisions on "scientifically reliable" data (e.g., data analogous to that provided by clinical trials in the medical field; Goldacre, 2013). The privileging of such "what works" research has been highly controversial since its emergence in the 1990s in Western English-speaking countries (e.g., see Hammersley, 1997). In particular, French educators often perceive any systematic invocation of "science" as an authoritative argument used by decision-makers to impose reforms that respond to political and ideological wishes. Thus, there is a certain mistrust regarding the use of research to guide professional practices, especially if those resources are presented as the only way to tackle teaching and learning issues. Evidence-informed practice (or EIP) is also perceived as a theoretical political discourse carrying ideological patterns. For instance, in the French-speaking world, EIP is often equated with mere rhetoric or an attempt to depoliticize debates. This view is well encapsulated by Laurent et al. (2009): "The increasing use of the notion of evidence-based policy is often equated with a rhetorical clause of no importance or the defence of a normative model of public decision-making rooted in the theory of rational choices" (p. 3). Owing to these connotations, the idea of EIP raises suspicion or, at the very least, is not considered a reliable concept by many teachers.

In a similar vein, EIP is neither a conceptual tool nor a popular research object for French academics (Laurent et al., 2009). In part, this is because much French educational research tends to be undertaken *in situ*. Such research is often criticized for its lack of cumulativity, generalisability and exploitable results. As a result, whereas the idea of EIP is beginning to mature in educational

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contexts such as England, it is still nascent in France. Nonetheless, policymakers continue to reaffirm the principles of research-based practices, as evidenced, for example, by the establishment in 2018 of the National Education Scientific Council (CSEN), an advisory body can be called upon to provide relevant education information. Somewhat problematically, however, the conditions for the implementation of research evidence in schools or its appropriation by teachers are generally not specified by policymakers. It is as a driect result of these contextual issues that the concept of EIP has not spread in France as in some other countries.

Notwithstanding contextual and attitudinal differences between French academics and educators and those in western English-speaking countries who have begun to adopt EIPs, two arguments are regularly invoked to suggest that engaging in EIP may be beneficial for teachers and students generally: (a) the growing evidence base that EIP can improve teacher understanding and practice and so positively impact on pupil outcomes (e.g., see Rose et al., 2017); and (b) the moral imperative, which implies that if teachers can improve how they teach through the use of research then they should do so (e.g., see Brown, 2017; Author, 2019; Oakley, 2000). As such, our aim with this study is to begin to search for clues as to what may help catalyse the adoption of EIP in schools in France. Drawing on a similar study conducted by the third author of this paper in England, we frame this study around three research questions:

1) To what extent are teachers' perceptions of research use associated with their perceptions of working in a trusting environment?
2) To what extent are teachers' perceptions of research use associated with their perceptions of working in an environment that encourages innovation (and collaborations centred on innovation)?
3) To what extent are teachers' perceptions of research use associated with their perceptions of working in an environment that values research for improving teaching and learning?

To situate this study, we begin with an overview of the French educational system.

Background

Educational System Organization and Conceptions of the Teaching Profession

Even with similarities across OECD countries, local educational patterns are highly contextual (Rey, 2013), and the strength of national traditions, attitudes, and cultures make change a slow process (Osborn, 2009). France remains at a level of minimal decentralization, characterized by a central government that is largely responsible for designing, operating and controlling the education system, in the areas of pedagogy, human resource management, and finance.

Looking at the job descriptions of teachers in France is also illuminating in that they remain predominantly focused on teaching time, not allowing much space for self-reflection or curiosity towards educational research. Correspondingly, the time that teachers must devote to activities other than teaching is not regulated in secondary schools. Since 2008, teachers in primary education must dedicate a definite amount of time to in-course training and mandatory educational seminaries (18 hours per year), work with colleagues, parent-teacher relations, and the follow-up of students with special needs (48 hours per year; Ministry of Education, 2008). This time allocation has been criticized, as it is not clear how many hours must be spent on each activity within the 18/48 allocation and the content of teachers' training can often be externally imposed (invariably in connection with the current reforms of the day). A new teaching status is, nonetheless, being redrawn to expressly include tasks that today are implicit but not specified, such as leadership roles.

Additionally, a new piece of legislation (the "Pour une école de la confiance" law) highlights the possibility that the teaching profession may evolve and be re-defined over time. Specifically, teachers' continuous training could become more notable and imposed, possibly outside teaching hours. Recent reports from the French *Inspections Générales* (e.g., Tardy et al., 2018) also feature the idea that lifelong training (specifically training based on educational research and collaborative work between teachers) should be integrated into teachers' missions and obligations. Thus, sitting at the core of such reports is a call for a change in the conception of the profession.

Collaborative Work and Leadership

At the heart of current French educational policies and reforms is a strong push for collaboration as a mechanism for engaging with and developing pedagogic innovation. Since the 1990s, collaboration, mirroring global trends (e.g., see Armstrong, 2015; Castells, 2011), has been one of the measures favoured by French legislators for reforming the organization of school systems and pedagogical practices (Merini, 2007). Education authorities worldwide have made urgent calls to overcome the individualism prevalent amongst the teaching profession, and today, educational institutions in many countries require teachers to develop new skills within a culture of cooperation (Butler & Schnellert, 2012; Pollard, 2005; Schleicher, 2012; Sebba et al., 2012). The emergence of professional learning communities, also known as communities of practice, as well as professional learning networks, represents an alternative to the traditional individual teaching model, which is now encountering limitations in the context of society's rising expectations for schools (Poortman & Brown, 2018; Kools and Stoll, 2016; Lave and Wenger, 1991; Stoll et al., 2006).

The French Cour des comptes (2013) insists[1] on the need to embrace the collective dimension of the teaching profession and to recognise individual and collective activities that are not yet identified as parts of teachers' service time, such as involvement in pedagogic improvement projects or leadership tasks. At the same time, strengthening collective work appears to be a central pitfall of many reform efforts: changing the school means changing the professional culture of teachers. While collaborative practices are associated with a stronger sense of self-efficacy and a higher level of teacher satisfaction, recent TALIS survey results show that teachers' collaborative practices are less frequent in France than in other countries (OECD, 2014).

Effective collaboration also seems linked to educational leadership that can encourage teachers to work collectively and generate a sense of collective efficacy (Goddard et al., 2015). Yet, the concept of leadership is not very popular in France. In the eyes of French teachers, leadership is often associated with formal non-teaching roles and additional levels of hierarchy. The notion of piloting new (externally determined) interventions or innovations is also offensive to certain sensitivities in the teaching profession: there is a culture traditionally hostile to this idea, raising objections on the grounds of pedagogical freedom. Schematically, while many English contexts treat leadership as a way to federate a group of individuals, to rally teaching teams around the school project, to create team cohesion based on trust, to generate improvements, and to set long-term goals, French teachers commonly view leadership "as a threat to individual autonomy" (Brest, 2011, p. 345). In other words, leadership is seen as a way to evaluate or control what happens in the classroom.

Similar issues arise with the role of "teacher leader." According to Gather Thurler (2015), teacher leaders within schools, both formal and informal, can influence the attitudes and behaviours of other teachers. For Sato et al. (2014), what motivates teachers to become leaders is the desire to become more involved in their school, the additional opportunities provided for professional development, and the potential to leverage specific links between leadership functions and day-to-day work with students. The missions entrusted to intermediate leaders (often known as teacher leaders or middle leaders) are diverse, but their general objective is to promote exchanges centred on teaching and learning issues. Even though the "leader position" does not exist in France, French teachers can assume some responsibilities or tasks that can be likened to those of teacher leaders. Teacher leadership is thus the influence teachers exert on their colleagues, principals, and other school community members to positively transform educational dynamics and foster student success. In France, leadership depends on individual assets (specific competence, use of organisational rules) and the capacity of actors to seize and create spaces of freedom within organisations, also known as *cognitive uncertainty zones* (Draelants & Dumay, 2011). However, for teachers to exercise formal leadership functions within their school, they must gain institutional recognition by taking an exam to become a principal or inspector.

Research Use Through Teacher Training

In France, research use is inseparable from debates on initial teacher training, the main aim of which is to equip teachers from a practical and theoretical perspective (Plaisance, 2019). Even so, cooperation and partnership between universities and teacher training programs have remained problematic for several decades. As the achievement of academic standards is prominent in the French conception of education (Lenoir, 2010; Osborn, 2009), it has always been feared that the introduction of educational research would be at the cost of academic excellence.

The recent "universitarization" of teacher education has been motivated by the desire to reform schools and develop teaching practices supported by research (Hensler, 2004). Recent reforms regarding teacher training (initiated in 2010 and revised in 2020) and accompanying directives to give an academic character to these programmes have been critical factors in developing the teaching profession. As such, it is likely that future teachers will increasingly need to engage with and in research (Filâtre, 2016; Cristofari et al., 2017; Tardy et al., 2018). These issues are noticeable in French institutional reports in which the urgency to reinforce such a link is clearly present. One way of reducing the gap between initial training and the requirements of professional practice has been the implementation of measures aimed at developing teachers' reflective competence, essentially through the analysis of their teaching (Viau-Guay, 2014). In other words, training content must be based on scientific work to familiarize trainees with scientific approaches and introduce them to the observation, analysis, and research-informed improvement of their professional practices (Ministry of National Education, 2013). Yet, at the same time, any initial teacher training program that ignores the immediate expectations of professionals in the name of higher reflexive postures runs the risk of being irrelevant or rejected. The training of professionals is expected to address professional issues, not to reproduce the model of university studies, nor to problematise praxis by placing theory and practice in opposition.

Beyond initial training, continuing education offers a way of staying in contact with research. Recently, however, French scholars have suggested that continuous professional development is often insufficient to stimulate earnest reflections on the contributions of research or even to develop a "research competence" that would enable teachers to adopt a reflective posture on their profession and their teaching (**Raulet-Marcel, 2019**). Building familiarity with research is further complicated in that teachers do not necessarily have the background to comprehend various methodological approaches or decipher specialised scientific literature. The training given to teachers often has little effect on their initial beliefs (**Crahay et al., 2010**), especially since a form of resistance to theories is commonly observed (**Lessard & Tardif, 2004**). Teachers have even been found to feel a kind of disdain towards knowledge that does not respond to the daily problems they encounter or withstand confrontations with reality (Perrenoud, 2004).

[1] The Cour des comptes is the supreme audit institution responsible for verifying the use of public funds and sanctioning failures to use them properly.

Evidence-Informed Practice in France

Bressoux (2017), commenting on a recent article by Bryk (2017) that examines how individuals learn to improve, acknowledges that despite increasing performativity demands on schools, transforming research evidence into improved practice remains a challenge. Bressoux (2017) identifies two types of difficulties concerning the concept of EIP: (a) the variability of the identified effects, and (b) the implementation on a large scale of what worked in a controlled, localized environment. In France, there is a commonly accepted idea which claims, under the pretext of the complexity of teaching-learning processes, that general knowledge about the effectiveness of some practices is not possible, and that effectiveness measured in one context cannot be transposed to another. In contrast, Bressoux (2017), among others, suggests there are general principles that hold true in most circumstances.

The divide between the spheres of research and practice in France is further complicated by incomprehension on both sides. Whereas researchers are more likely to propose new protocols than gradually improve on approaches that have already been implemented in the field, innovations that come from teachers are often disparate, unassessed, and non-cumulative, meaning they are rarely studied on a significant scale by educational researchers or are not considered research material at all. Furthermore, there is little institutional support for teachers and researchers to initiate and maintain long-term collaborations. Some institutional initiatives such as *Expérithèque* have tried to implement research evidence via a form of instrumental use (see Brown, 2017) but this has led to disappointing results, owing in part to the time-consuming involvement required from teachers and the marginal successes realized in return.

The plurality of types of knowledge necessary for effective teaching also makes the implementation of EIP complex, especially since successive reforms are constantly modifying how schools are organized (Jorro & Tutiaux-Guillon, 2015). One recommendation of a recent French report was to "incorporate scientific approaches in teacher training. . . . [by] teaching the teachers to problematize professional situations and to consider research as a potential resource to help them" (Filâtre, 2018, p. 34). This report calls for the implementation of pedagogical approaches supported by research and based on validated practices. As we note above, collaborative inquiry is increasingly viewed as an effective way to improve educational practice, including that informed by research (e.g., see Butler & Schnellert, 2012; Pollard, 2005; Schleicher, 2012). Yet, there is little data on collaborative work between teachers in school establishments in France and even less on the use of educational research in teachers' everyday practice. It is this knowledge gap that the RECAP (Réseau et Communautés d'Apprentissage Professionnels) exploratory study seeks to address.

Why launch RECAP in France[2]*?*

Professional interactions among teachers act as channels for the circulation of professional knowledge and expertise that can be used to improve teaching practices. However, to date, few studies have examined how professional learning within French schools and educational institutions can facilitate EIP. In response, the unit Veille & Analyses of the French Institute of Education (ENS de Lyon) launched an exploratory survey entitled RECAP with the following objectives:

a) to better understand the collaborative work habits of educational teams (teachers, supervisory and support staff) and what affects such collaborations,
b) to better understand the nature of within-school professional learning, and
c) to better understand the perceptions of educational personnel about research and to question the possibility of integrating research into their professional practices.

As part of the wider project, this paper illustrates how the RECAP survey has helped us address the three abovementioned research questions. These questions examine the extent to which school climates characterized by trust, innovation, and valuing research are associated with perceptions of research use.

Methodology

Research Design

This study employed quantitative survey methods (Groves et al., 2009; Fowler 2002), drawing upon research previously conducted in England (Brown, Daly, & Liou, 2016). The English study aimed to identify possible levers to promote the development of EIP in schools by teachers. The questionnaire for this original study was translated and adapted to suit the French context and subsequently tested with teachers, school directors and other education personnel, modified when necessary and tested again. The French survey was designed in partly equivalent terms to allow an international comparison while also ensuring sensitivity to the national context, with several questions rephrased to suit the French context. One example of such structural adaptations is that we could not use the item, "When middle leadership in this school tell you something you can believe it," because there are no formal middle leaders in France. Cultural adaptations were also necessary for the French context. This was the case, for instance, with the item, "My school

[2] The implementation of RECAP is not part of a political approach; it is not a question of defending the idea that only scientific knowledge can respond to educational issues and must be mobilised by teachers. Instead, the RECAP project aims to question what makes teachers in France more or less inclined to look for elements in research work that could help them in their professional practice.

encourages me to use research findings to improve my practice." The French version asks, "My school encourages educational staff to use research contributions to improve practice." This concept of *research contributions*, for which participants were given a definition, was used because many French teachers are not familiar with the concept of research use in classrooms.

Another difference from the English study was that 20 of the 43 participating English schools were in a Teaching School Alliance, where there is a formal commitment to engage with research. The other 20 English schools were attempting to enter a research alliance. These circumstances meant that all teachers were strongly encouraged to participate in the study. On the French side, the idea that research evidence can be implemented in schools is still emerging, resulting in fewer external drivers to participate. Thus, the survey was addressed to both primary and secondary school teachers to increase the number of schools likely to respond (the sample for the English study was primary only).

Sample and Data Collection

As a first step, we created the online survey using the Lime Survey application (developed by École normale supérieure) and selected an initial pool of primary and secondary schools where we believed (from personal knowledge of these schools) that a substantial proportion of teachers would be willing to participate. There was no obligation for teachers to participate, merely encouragement from the school leader. The first launch (March 2018) was unsuccessful in that we found it difficult to:

- find an adequate time period during which we could administer the questionnaire but not give teachers inordinate work;
- gain access to teachers' names, occupations, and email addresses; and
- reassure potential participants that their anonymity would be preserved.

For the second launch (October 2018), we enlisted the help of institutional partners who acted as school gatekeepers and could attest to the credibility of our survey (vital as French educational personnel are not overly trusting of either educational research or researchers). This second launch led to a sampling frame of two primary and five secondary public schools that, following conversations with school leaders, were identified as ones where EIP was a strength as well as a focal point for continuous improvement. Similar to Farley-Ripple and Buttram (2014), although we recognize the limitations of judgement sampling, in the absence of more objective indicators of research use, relying on the advice of school leaders provided a pragmatic approach for undertaking the study. At the same time, this sampling design means that respondents are likely unrepresentative of the population of French teachers. The survey was distributed to all teachers in our sampling frame, with responses accepted until December 2018.

Data collected included demographics about teacher characteristics (Table 1) in addition to perception scales related to successfully and meaningfully using research for school improvement (see Brown & Greany, 2018; Brown, Daly, & Liou, 2016; Finnigan & Daly, 2012). As the perception scales had not been applied previously in a French context, we refrained from assuming any *ex ante* factor structure. A total of 21 Likert-type items invited participants to report on the climates of trust and innovation in their schools, the degree to which they felt supported in using research, and their perceptions about the benefits of research use. Each item provided response options ranging from 1 (strongly disagree) to 4 (strongly agree). In total, 172 complete responses were received, yielding a response rate of 40.2%, a respectable number for a web-based survey (Shih & Fan, 2008).

Data Analysis

Following an initial inspection of data quality (i.e., participant demographics and general response patterns for the Likert-type items), we organized the analytic procedure into the three steps outlined below.

Step 1: Exploratory Factor Analysis

The underlying constructs targeted by the perception scales were investigated using exploratory factor analysis. Factors were extracted using principal axis factoring (Fabrigar et al., 1999) and, given the correlation between factors evidenced in earlier research (e.g., Author, 2016), an oblique rotation (direct quartimin) was used to clarify the factor structure (Costello & Osbourne, 2005). Additionally, as individual questionnaire items were measured on an ordinal scale, a polychoric correlation matrix was used instead of the more common Pearson correlation matrix, which also has the benefit of accounting for higher levels of skewness in the data (Gaskin & Happell, 2014).

Table 1
Sample Demographics

	Number	**Percent**
Gender (female)	106	61.6
Special responsibilities (yes)	66	38.4
Training in last 3 years (yes)	115	66.9
Hold a formal leadership or support role	50	29.1
	Mean	**Standard Deviation**
Age	44.66	9.60
Years in current school	8.53	8.36

Sampling adequacy was determined by considering (a) the strength of each Likert-type item's relationship with the factors, (b) factor overdetermination, and (c) the number of measured items (Watkins, 2018). Where items failed to achieve mid-range factor loadings greater than .50 or exhibited alternative factor loadings (cross-loadings) greater than .30 (Gaskin & Happell, 2014), they were sequentially removed and the factor analysis was re-run. Additionally, the Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's Test of Sphericity were inspected to verify the data were factorizable. The number of factors to retain was determined using both Kaiser's (1960) rule of eigenvalues greater than one and Cattell's (1966) scree test. Factors were named according to the dominant themes of the items within each factor, and unit-weighted factor scores calculated by averaging the responses to individual items, respecting (a) the long-established issues with factor indeterminacy and (b) the simple approach of item averaging or summation leading to results that are more comparable across samples (e.g., see Grice, 2001).

Step 2: Descriptive Statistics and Correlational Analysis

Descriptive statistics were calculated for all items and factor scores. The degree to which factor scores approximated a normal distribution was verified by visual inspection of histograms and of normal Q-Q plots. Bivariate correlations among the latent factors were calculated using the Pearson product-moment correlation, enabling determination of the strength and direction of the linear relationship between factors in addition to the existence of any multicollinearity issues with the predictor variables for the multiple regression.

Step 3: Hierarchical Multiple Regression

After determining the RECAP questionnaire's factor structure, we conducted a hierarchical multiple regression to model respondents' perceptions of research use as a function of (a) teachers' demographic variables, (b) their perceptions of working in a trusting environment, (c) their perceptions of working in an environment that encourages innovation, and (d) their perceptions of working in an environment that values research for improving teaching and learning. A hierarchical approach enabled us to assign different priorities to the predictor variables according to prior research before examining their influence on the dependent variable. We were specifically interested in how a climate of valuing research use predicted teachers' perceptions of research use over and above climates of trust and innovation. All assumptions of the linear model were met. It is noteworthy that we did not employ a multilevel model for two reasons: (1) we were specifically interested in how the sequential addition of predictor variables added to the explained variance, and (2) our sample size did not meet recognized guidelines for multilevel modeling (e.g., see Maas & Hox, 2005).

Results

Factor Analysis

Several test runs for the exploratory factor analysis were conducted to determine a meaningful factor structure. Initial solutions indicated that our factor model benefitted from the removal of two items: (a) an item adapted from Author's (2016) climate of trust scale (i.e., "People in your school readily share information about resources and/or effective methods"), and (b) an item designed to query the school climate of innovation (i.e., "I am using another forum/platform/collaborative network for professional exchanges

Table 2
Exploratory Factor Analysis Factor Loadings and Item-Level Descriptive Statistics

Factor and Associated Items	Mean (SD)	Factor Loading
Perceptions of Research Use (PoRU; Cronbach's α = .859)		
Research and scientific data tell us about possible improvement strategies	2.95(0.72)	0.944
Changes within my school should not be implemented without support of research contributions	2.91(0.71)	0.913
I think research ideas can help me try new approaches in the classroom	3.05(0.78)	0.725
The information I find in theoretical literature plays an important role in changing my teaching practices	2.80(0.80)	0.644
Climate of Trust (CoT; Cronbach's α = .864)		
Even in difficult situations, staff in my school can depend on each other	3.05(0.70)	0.874
Staff in my school trust each other	3.12(0.64)	0.844
Staff in my school respect each other	3.31(0.65)	0.798
I trust my administration	3.27(0.79)	0.755
When teaching staff in my school tell you something, you can believe it	3.27(0.66)	0.736
When senior/middle leadership in my school tell you something, you can believe it	3.30(0.72)	0.684
Climate of Innovation (CoI; Cronbach's α = .780)		
My school has a formal process for evaluating programs or practices	2.62(0.78)	0.719
My school organizes exchange times on pedagogical principles and guidelines	2.75(0.82)	0.680
My school is experimenting with new ways of working	2.97(0.80)	0.637
Staff appreciate new projects implemented in my school/institution	2.91(0.68)	0.601
I use ENT/an institutional site for professional exchanges with colleagues from my school	2.45(1.14)	0.597
In my school there is time for school staff to learn new teaching practices	2.54(0.82)	0.571
Climate of Research Use (CoRU; Cronbach's α = .861)		
The people I work with discuss research data to stimulate debate on certain issues	2.49(0.94)	0.890
Since the beginning of the year, I have had the opportunity to discuss research with my colleagues	2.53(0.96)	0.881
My school encourages teachers to use the results of research to improve practices	2.63(0.92)	0.684

Note. Extraction method: Principle Axis Factoring. Rotation Method: Oblimin with Kaiser Normalization. Rotation converged in 7 iterations.

with colleagues at my school"). It is noteworthy that the former item also exhibited the weakest factor loading in Author's (2016) original study, and the latter was the sole item not featured in Author's (2016) climate of innovation scale. The final solution for this study (Table 2) explained 72.9% of the total variance, with a value for the Kaiser-Meyer-Olkin measure of .730 and a statistically significant result ($p < .001$) for Bartlett's Test of Sphericity. Inspection of the rotated factor loadings resolved four factors (Table 2) that closely aligned with those identified in the English study. We named the factors as follows:

- *Perceptions of Research Use* (PoRU), which measured how participants viewed the benefits of using educational research within their professional practice;
- *Climate of Trust* (CoT), which measured participants' perceptions of the levels of trust within their school;
- *Climate of Innovation* (CoI), which measures participants' perceptions of the extent to which their school has the structures and processes in place to support organizational change and improvement; and
- *Climate of Research Use* (CoRU), which measures participant's perceptions of whether they work in an environment that values educational research for improving teaching and learning.

The internal consistency of each factor as measured by Cronbach's alpha (Cronbach, 1951) exceeded the generally recognized .70 lower-bound (Watkins, 2018). The CoT and CoI factors each included seven Likert-type items, whereas the PoRU and CoRU factors included four and three Likert-type items, respectively.

Descriptive Statistics and Correlation Analysis

Table 2 presents descriptive results for the individual items comprising each factor. On average, staff believed their schools possessed high levels of trust, both among teaching staff and leadership (means ranging from 3.05 to 3.31). Perceptions of research use were similarly positive, suggesting that respondents generally believed that research evidence could inform on their teaching and learning practices as well as school organization at large (means ranging from 2.80 to 3.05). It is noteworthy – given the discussion in the context section above – that the lowest scoring item for the PoRU factor concerned school staffs' views on the utility of theoretical literature for informing their teaching practices. Staffs' perceptions were comparably neutral when it came to their schools' climate of innovation (means ranging from 2.45 to 2.97) and climate of research use (means ranging from 2.49 to 2.63). What stands out in the former, the CoI factor, is the item asking staff about their use of an institutional site for professional exchanges, which displayed the greatest variance of all items ($SD = 1.14$). This response variability suggests that while some staff are highly active in online professional exchanges, others interact seldomly online, if at all. On the other hand, the items of the CoRU factor collectively yielded the greatest overall variance (Table 3), suggesting that staff held divergent perspectives about the degree to which their school had developed a climate of research use.

Table 3 presents the overall descriptive and correlational results for the resolved factors. Following from the individual item statistics, the CoT factor displayed the greatest mean, followed sequentially by the PoRU, CoI, and CoRU factors. Moreover, a statistically significant ($p < .001$) moderate positive correlation existed between all pairs of factors. The strongest correlation existed between the PoRU and CoRU factors ($r = .545$), with school staffs' positive perceptions about the use of research evidence explaining 30% of the variance in staffs' perceptions of the extent to which their school is focused on using research, without controlling for other variables.

Hierarchical Multiple Regression

Hierarchical multiple regression was employed to determine if addition of the CoT, CoI, and CoRU factors sequentially improved prediction of school staffs' PoRU beyond that afforded by the demographic variables. The first model incorporated only the demographic variables for school staff, explaining 17.2% of the variance in PoRU around the mean, $F(8, 171) = 4.24$, $p < .001$. In the second model, the addition of CoT increased explained variance by 6.2%, $F_{change}(1, 162) = 13.02$, $p < .001$. In the third model, the addition of the CoI increased explained variance by 1.8%, yet the change was not significant, $F_{change}(1, 161) = 3.83$, $p = .052$. Finally, in the fourth model, the addition of CoRU increased explained variance by 15.3%, $F_{change}(1, 160) = 41.09$, $p < .001$. This full model consequently explained 40.2% of the variance in the PoRU factor, $F(11, 160) = 9.88$, $p < .001$. As Table 4 shows, in terms of the demographic variables, whether school staff held special responsibilities within their school was negatively associated with PoRU ($\beta = -0.13$, $p = .047$), while whether they received any training related to research use within the past 3 years was positively associated with

Table 3
Descriptive Statistics and Correlation Matrix for Factors

Factor	Mean (SD)	Correlation Matrix 1	2	3
Perceptions of Research Use (PoRU)	2.94 (0.63)			
Climate of Trust (CoT)	3.22 (0.53)	0.336		
Climate of Innovation (CoI)	2.71 (0.59)	0.344	0.423	
Climate of Research Use (CoRU)	2.55 (0.83)	0.545	0.346	0.426

Note. All correlations significant at $p < .001$

Table 4
Hierarchical Multiple Regression Predicting School Staffs' Perceptions of Research Use

Predictor Variables	Model 1		Model 2		Model 3		Model 4	
	B	*β*	*B*	*β*	*B*	*β*	*B*	*β*
	(SE)		*(SE)*		*(SE)*		*(SE)*	
(Intercept)	2.99 (0.15)		2.85 (.15)		2.91 (0.16)		2.92 (0.14)	
Gender (0, female; 1, male)	-0.21 (0.09)	-0.16*	-0.16 (0.09)	-0.13†	-0.14 (0.09)	-0.11	-0.15 (0.08)	-0.12†
Position (0, teacher; 1, other)	0.12 (0.11)	0.09	0.09 (0.11)	0.06	0.09 (0.11)	0.06	0.06 (0.10)	0.05
Special responsibilities (0, no; 1, yes)	-0.12 (0.10)	-0.10	-0.11 (0.10)	-0.08	-0.12 (0.10)	-0.09	-0.18 (0.09)	-0.13*
Training in last 3 years (0, no; 1, yes)	0.32 (0.10)	0.24**	0.30 (0.10)	0.22**	0.29 (0.10)	0.22**	0.21 (0.09)	0.16*
Age	0.00 (0.01)	0.01	0.00 (0.01)	0.02	0.00 (0.01)	0.01	0.00 (0.01)	-0.03
Years in current school	-0.01 (0.01)	-0.15	-0.01 (0.01)	-0.13	-0.01 (0.01)	-0.13	-0.01 (0.01)	-0.09
CoT			0.343 (0.10)	0.29***	0.24 (0.11)	0.20*	0.16 (0.10)	0.14†
CoI					0.19 (0.10)	0.18†	0.02 (0.09)	0.02
CoRU							0.34 (0.05)	0.45***
R^2	.172	.234	.252	.404				
ΔR^2		.062	.018	.153				
F	4.24**	5.49**	5.41**	9.88**				
ΔF		13.0**	3.83†	41.09**				

Note. †$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$; *B* = unstandardized regression coefficient; *SE* = standard error of the coefficient; *β* = standardized coefficient. All models controlled for differences in the CoT, CoI, and CoRU factors between schools. CoT, CoI, CoRU, and age were mean centered.

PoRU ($\beta = 0.16$, $p = .018$). Additionally, gender (that is, the categorical change from female to male) exhibited a negative association with PoRU (β = -0.12, $p = .068$), though the statistical evidence for the veracity of this relationship was weak. Evidently, from inspection of the standardized beta coefficients, these categorical demographic variables were of comparable predictive importance. Focusing instead on the perception factors, CoRU was positively associated with PoRU ($\beta = 0.45$, $p < .001$), a relationship between two and three times as strong as the significant demographic predictors. CoT also exhibited a positive association with PoRU ($\beta = 0.14$, $p = .093$), yet, like gender, the statistical evidence for this relationship was weak.

Closer examination of the changes between models of the regression reveals several further insights. First, when CoI was introduced in Model 3, it exhibited weak statistical evidence that perceptions of school orientation to organizational change and improvement were positively associated with PoRU ($\beta = 0.18$, $p = .052$). However, upon introduction of CoRU in Model 4, the strength and evidence of this association decreased considerably. In other words, a school staff member is more likely to hold positive views about using research when at a school with a climate where research use is valued and supported, above school orientation to innovation generally. This finding suggests that CoRU may be a mediating variable for influence of CoI on PoRU. Second, between Model 2 and Model 4, the standardized coefficient and statistical evidence for CoT decreases in a way similar to CoI. Specifically, although CoT is the strongest predictor in Model 2 ($\beta = 0.29$, $p < .001$), this influence is greatly reduced by inclusion of CoI and, in particular, CoRU. That is, while it appears a trusting environment is important for staff members holding positive perceptions about research use, it appears relatively less important than a school climate that encourages and supports research use.

Discussion and Conclusions

This study aimed to explore what can help catalyse the adoption of EIP in schools in France. In particular, by drawing on previous work examining EIP in England, our study explored the extent to which teachers' perceptions that they are working in a trusting environment and/or an environment that encourages innovation affects their attitudes towards research use. Moreover, we examined how teachers' perceptions concerning research use are related to their perceptions of their schools' climate of research use. As with previous studies in this area (e.g., see Coldwell et al., 2017; Walker et al., 2019), our findings suggest a normative agreement amongst French educators that EIP is a 'good thing' and should be pursued: this is evident by the mean score of around three for most items on the *Perceptions of Research Use* factor (although respondents also reflected that such research had to have a practical rather than theoretical element). Nevertheless, as has been shown elsewhere (e.g., Brown, 2017; Coldwell et al., 2017; Walker et al., 2019), there is often a difference between what teachers indicate is an optimal situation and their actions. With this survey, we did not ask teachers to self-report whether they used research to improve their practice, but our earlier analysis (see Background section) suggests that this is

often not the case. Neither can we triangulate our findings with any independent external data (such as observations of practice). However, some evidence can be found in the responses to the *Climate of Research Use* factor, which suggest that, irrespective of their views on using research, teachers are generally less likely to feel that they are encouraged within their school to engage with such evidence. Furthermore, the regression analysis found that perceptions of research use and climates of research use are positively related: when teachers feel they work in an environment that values research use, they are likely to have more positive perceptions about using research to improve their practice. So while many teachers have a positive attitude towards EIP, getting them to engage in it is likely to be a function of how well schools can establish a climate of research use.

Our findings do provide some insights into how such a climate might be fostered. When we explored perceptions of trust and innovation, we found that teachers generally felt they worked in trusting environments. Still, they were less inclined to feel that they were encouraged by their school leaders to innovate. This observation suggests a critical difference between the French and English contexts: while trust is vital for facilitating research use in the latter, perceptions of the school's climate of research use, which appears related to the school's culture of innovation, seem more important for the former. This finding contrasts with much of the current English language literature on EIP and is likely to reflect the differences in wider macro-level structures such as accountability structures (e.g., see Godfrey, 2020; Godfrey & Spence-Thomas, 2020). In high-stakes systems, teachers need to feel supported to go beyond the tried and tested approaches to teaching and learning, as such activity is risky in that it can lead to failure (Author, 2019). Teachers thus need to know that someone "has their backs" should things go wrong. In the French system, however, much change is externally mandated. This structure means that teachers, when ordinarily operating under a norm of being "done to," therefore require encouragement to move to a situation of "doing it for themselves."

This situation thus poses an interesting challenge: namely, if schools are to heed the call of the French Minister of National Education and ensure education is evidence-informed, how can cultures of research use and of innovation as a way "things are done around here" be established (Sanchez, 2004)? In western English-speaking countries, realising such a goal has in more recent times come under the purview of school leaders, often in partnership with school district administrators. Unfortunately, however, several studies have shown that, among the factors that seem to define effective school leadership in the United States, some seem to travel quite poorly in Europe (Bressoux, 1994). Whereas in the United States or England, school leaders are able to use the transformational or learning-centred aspects of leadership to support teachers and schools to engage with research and EIP (e.g., see Day & Sammons, 2013), in France, the principal is seen rather as *primus inter pares*, with much more limited administrative and pedagogical powers. As a result, this means school leaders in France have few levers to increase teachers' commitment towards specific organizational goals, vision, and direction (Bush & Glover, 2003). Likewise, they have limited authority to improve teaching in their school, the forms of collaboration between teachers, or the behaviour of teachers in their work with students (e.g., Timperley & Robertson, 2011).

If EIP is to become a reality in French schools, it would appear required for central policymakers to consider how best to normalise teacher collaboration centred on and grounded in research use and undertaken to achieve innovative practice improvements. Examining extant literature in the area of EIP, we believe this will be most effectively achieved by policymakers attending to the following three areas:

1) **Formalising the use of research:** Previous studies clearly show that research use is more likely to occur when school-level and national-level policies explicitly encourage EIP (e.g., Biddle & Saha, 2006; Coldwell et al., 2017; Fullan, 2002; Scott & McNeish, 2013). Based on this literature, our findings suggest that, for the French context, EIP activity needs to be formally linked to policies and processes that signal the importance of the work; also that engaging in EIP and developing (innovating) new initiatives grounded in research-evidence is not 'just another initiative', but something that is key to how teachers should operate. Approaches to formalising research engagement encompass the inclusion of EIP-related activity in improvement plans and teachers' performance management targets. Also by ensuring that EIP engagement is on the radar of school governing bodies. It can also occur through agreements with any staff bodies responsible for delivering change in schools (such as school steering groups). At the same time, such signals need to be meaningful. There is no point adding priorities to improvement plans if there are already so many that the notion of something being a 'priority' no longer has currency. Likewise, agreements with steering groups (or other similar bodies) only make sense if such groups know how to deliver against them (with the capacity to engage with research covered in 'mobilisation', below).
2) **Prioritising research use:** Teachers in France regard themselves as overburdened, and if we want them to do more of something, we need to ensure they can do less of something else (see Brown 2020; Galdin-O'Shea, 2015). Policymakers must therefore consider how to change existing teaching commitments to free up time: for example, by reassigning existing teaching time to create a free half-day once a week; by reallocating existing non-teaching time towards research use; or through smart approaches to timetabling (which can serve to save time within existing timetables). Another approach common in countries such as England is the designation of certain individuals as Research Champions. In other words, the formal assignment of a part of a teacher's role to supporting and encouraging their colleagues to engage with research (for the characteristics of effective research champions, see Brown, 2017). Affording time to teachers will go a long way to helping them engage with research effectively, but time also needs to be allocated to help teachers engage with their colleagues to ensure that EIP-related collaboration can occur. This also means that processes within the school need should be used to facilitate such collaboration. For instance, timetables should reflect that the need for collaboration between particular groups of teachers.
3) **Mobilising research evidence:** As we note in the context section, an area of frustration for teachers is accessing and engaging with research effectively. To address this, we suggest policymakers attend to the following five capacity-building factors:
    i) **An understanding of research approaches and methods**, the strengths and limitations of each, and knowledge of core aspects of the research process (e.g., sampling, analysis, validity and reliability). Building this type of capacity is invaluable; it

enables teachers to ascertain the robustness of a particular study and the types of inference or understanding they may draw from it (e.g., Cain, Brindley, Brown, Jones, & Riga, 2019; Goldacre, 2013). It also enables teachers to engage in their own research inquiries with colleagues.

ii) **The ability to understand how the findings of any given study can be effectively recontextualised**, rather than simply "cutting and pasting" approaches to EIP from one setting to another. Such direct transfers are unlikely to be effective, so teachers need the capacity to gauge which theories of action and supporting or dependent factors were required to make the intervention work in its original setting. In turn, they also need the ability to ascertain the extent to which such factors are also present in their setting and whether appropriating an approach is likely to engender similar outcomes as in the original setting (Cartwright, 2013; Moss, 2013).

iii) **Free and unencumbered access to a robust evidence base.** Arguments abound that educators need access to research evidence held in academic journals or research databases as well as access to high-quality research syntheses (e.g., Cordingley, 2000; Goldacre, 2013). Such access enables a more cumulative perspective on topics of teaching and learning. Syntheses (such as those provided by the Education Endowment Foundation or the What Works Clearinghouse) are particularly useful, as they are often written in an accessible language, enabling practitioners to quickly and easily engage.

iv) **An understanding of cycles of inquiry and an approach to measuring impact** (e.g., those set out in Halbert et al., 2011, or Timperley et al., 2014). Engagement with research evidence should not occur in isolation; rather, it should be undertaken within the context of a wider collaborative and iterative cycle of inquiry, innovation and improvement. Here, goals are set (via the analysis of data), the current situation or issue(s) ascertained, hypotheses developed, new approaches implemented, and their success measured (with approaches then refined, scaled up or dropped as a result). A cycle of inquiry is most effective when undertaken in a way that helps teachers make connections and examine the relationships between what they do (teaching activity) and its outcomes (how students fare in response). Correspondingly, as schools progress through the cycle, only successful EIPs are implemented.

v) **Considering effective partnerships between schools and universities and/or other educational partners,** enabling a pooling of knowledge, expertise, and resources (Bryk et al., 2010). These types of partnerships (sometimes referred to in the United States as research-practice partnerships) could encompass initial teacher education and further capacity building through the undertaking of post-graduate qualifications or the provision of continuous professional development (which will help address points i and ii above). Universities can also provide access to research evidence or use their expertise to synthesise and make available evidence in areas of importance to schools and French policymakers (point iii). Finally, academics from schools of education may also have a key role in working with professional learning communities within schools or professional learning networks across schools to facilitate inquiry cycles as detailed in point iv above (Brown, Daly, & Liou, 2016; Author, 2020b).

EIP, dialogue between education researchers and practitioners, and collaborative work within schools still need to be fostered in France. RECAP shows that even though French education staff and the French school system are not yet familiar with those concepts or practices, a good basis for their development exists, as most respondents have a positive perception of research use. However, this study illustrates a clear need for more research on teachers' collaborative practices and the use of research in their daily practice in order to further identify levers for increasing EIP and an understanding of how its implementation can be sustainable. This future research could take the form of surveys—and ideally lead to an analysis of school social networks—but also of observations (activity analysis), focus groups, or in-depth interviews. We look forward to taking up this challenge!

Declaration of competing interest

We have no known conflict of interest to disclose.

References

Poortman, C., & Brown, C. (2018). The importance of Professional Learning Networks. In C. Brown, & C. Poortman (Eds.), *Networks for learning: Effective collaboration for teacher, school and system improvement.* Routledge.

Brown, C., & Greany, T. (2018). The evidence-informed school system in England: Where should school leaders be focusing their efforts? *Leadership and Policy in Schools, 17*(1), 115–137.

Brown, C. (2020). *The networked school leader: How to improve teaching and student outcomes using learning networks.* Emerald.

Armstrong, P. (2015). *Effective partnerships and collaboration for school improvement: A review of the evidence.* Department for Education.

Biddle, B. J., & Saha, L. J. (2006). How principals use research. *Educational Leadership, 63*(6), 72–77.

Bressoux, P. (2017). Practice-based research : une aporie et des espoirs. *Éducation et didactique, 11-3*, 123–134.

Bressoux, P. (1994). Les recherches sur les effets-écoles et les effets-maîtres. *Revue Française de Pédagogie, 108*, 91–137.

Brest, P. (2011). Le leadership dans les organisations publiques : le cas des chefs d'établissement de l'enseignement secondaire. *Politiques et management public, 28/3*.

Bryk, A. S., Gomez, L. M., & Grunow, A. (2010). *Getting ideas into action: Building networked improvement communities in education.* Carnegie Foundation for the Advancement of Teaching.

Brown, C. (2017). Achieving evidence informed policy and practice in education: EvidencED. *Emerald*.

Brown, C., Daly, A., & Liou, Y.-H. (2016). Improving trust, improving schools. *Journal of Professional Capital and Community, 1*(1), 69–91.

Bryk, A. S. (2017). Accélérer la manière dont nous apprenons à améliorer. *Éducation et didactique, 11-2*, 11–29.

Bush, T., & Glover, D. (2003). *School leadership: Concepts and evidence.* National College for School Leadership.

Butler, D. L., & Schnellert, L. (2012). Collaborative inquiry in teacher professional development. *Teaching and Teacher Education, 28*(8), 1206–1220.

Cain, T., Brindley, S., Brown, C., Jones, G., & Riga, F. (2019). Bounded decision-making, teachers' reflection, and organisational learning: How research can inform teachers and teaching. *British Educational Research Journal, 45*(5), 1072–1087.

Cartwright, N. (2013). Knowing what we are talking about: Why evidence doesn't always travel. *Evidence & Policy, 9*(1), 97–112.
Castells, M. (2011). *The rise of the network society*. Wiley-Blackwell.
Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1*, 245–276.
Coldwell, M., Greany, T., Higgins, S., Brown, C., Maxwell, B., Stiell, B., Stoll, L., Willis, B., & Burns, H. (2017). *Evidence-informed teaching: An evaluation of progress in England*. Department for Education.
Cordingley, P. (2000). In *, July 7-9. Teacher perspectives on the accessibility and usability of research outputs: A paper prepared by P. Cordingley and the National Teacher Research Panel to the BERA 2000 conference*. Cardiff University.
Costello, A. B., & Osbourne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation, 10*(7), 1–9.
Cour de comptes. (2013). Gérer les enseignants autrement. Author.
Crahay, M., Wanlin, P., Issaieva, É., & Laduron, I. (2010). Fonctions, structuration et évolution des croyances et connaissances des enseignants. *Revue française de pédagogie, n°, 172*, 85–129.
Cristofari, Y., Le Pivert, P., & Lussiana, P. (2017). Évaluation de la politique publique sur la formation continue des professeurs du premier degré (Rapport de diagnostic No 2017035). Paris: IGEN, IGAENR.
Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297–334.
Day, C., & Sammons, P. (2013). *Successful leadership: A review of the international literature*. CfBT Education Trust.
Draelants, H., & Dimay, X. (2011). *L'identité des établissements scolaires*. PUF.
Fabrigar, L. R., MacCallum, R. C., Wegener, D. T., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*(3), 272–299.
Farley-Ripple, E. N., & Buttram, J. L. (2014). Developing collaborative data use through professional learning communities: Early lessons from Delaware. *Studies in Educational Evaluation, 42*, 41–53.
Filâtre, D. (2016). Vers un nouveau modèle de formation tout au long de la vie. *Comité national de suivi de la réforme de la formation des enseignants et personnels d'éducation*. MEN.
Filâtre, D. (2018). *Améliorer la formation initiale des professeurs des écoles. Paris: Comité national de suivi de la réforme de la formation des enseignants*. MEN.
Finnigan, K. S., & Daly, A. J. (2012). Mind the gap: Organizational learning and improvement in an underperforming urban system. *American Journal of Education, 119*, 41–71.
Fullan, M. (2002). The role of leadership in the promotion of knowledge management in schools. *Teachers and Teaching: Theory and Practice, 8*(3), 409–419.
Galdin-O'Shea, H. (2015). Leading "disciplined enquiries" in schools. In C. Brown (Ed.), *Leading the Use of Research &Evidence in Schools*. IOE Press.
Gaskin, C. J., & Happell, B. (2014). On exploratory factor analysis: A review of recent evidence, an assessment of current practice, and recommendations for future use. *International Journal of Nursing Studies, 51*(3), 511–521.
Gather Thurler, M., Pelletier, G., & Dutercq, Y. (2015). **Leadership éducatif ?** *Recherche et formation*, (78), 95–109.
Goddard, R., Goddard, Y., Sook Kim, E., & Miller, R. (2015). A theoretical and empirical analysis of the roles of instructional leadership, teacher collaboration, and collective efficacy beliefs in support of student learning. *American Journal of Education, 121*(4), 501–530.
Godfrey, D. (2020). Evaluation theory and peer review. In D. Godfrey (Ed.), *School peer review for educational improvement and accountability: Theory, practice and policy implications*. Springer.
Godfrey, D., & Spence-Thomas, K (2020). Research-informed peer review. In D. Godfrey (Ed.), *School peer review for educational improvement and accountability: Theory, practice and policy implications*. Springer.
Goldacre, B. (2013). *Building evidence into education*. Department for Education.
Grice, J. W. (2001). Computing and evaluating factor scores. *Psychological Methods, 6*(4), 430–450.
Groves, R. M., Fowler, F. J., Jr., Couper, M. P., Lepkowski, J. M., Singer, E., & Tourangeau, R (2009). *Survey methodology* (2nd ed.). Wiley.
Halbert, J., Kaser, L., & Koehn, D. (2011). Spirals of inquiry, building professional inquiry to foster student learning. In *Paper presented at ICSEI 2011*.
Hammersley, M. (1997). Educational research and teaching: A response to David Hargreaves' TTA lecture. *British Educational Research Journal, 23*(2), 141–161.
Hensler, H., et al. (2004). Pour une ouverture de la culture professionnelle aux savoirs de la recherche en éducation: quelles conditions aménager en formation initiale et continue ? (dir) In Claude Lessard, et al. (Eds.), *Entre sens commun et sciences humaines*. Bruxelles: De Boeck.
Jorro, A., & Tutiaux-Guillon, N. (2015). Savoirs profanes, savoirs scientifiques dans la formation des enseignants. *TransFormations*, 13–14. n°.
Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychology Measurement, 20*, 141–151.
Kools, M., & Stoll, L. (2016). *What makes a school a learning organisation: A guide for policy-makers, school leaders and teachers*. OECD.
Laurent, C., Baudry, J., Berriet-Solliec, M., Kirsch, M., Perraud, D., Tinel, B., Trouvé, A., Allsopp, N., Bonnafous, P., Burel, F., Carneiro, M. J., Giraud, C., Labarthe, P., Matose, F., & Ricroch, A. (2009). Pourquoi s'intéresser à la notion d'« evidence-based policy » ? *Revue Tiers Monde, 200*, 853–873.
Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge university press.
Lenoir, Y. (2010). Conception de l'éducation scolaire en France et aux États-Unis : une perspective sociohistorique comparative. *La formation des enseignants en Europe* (pp. 17–32). Bruxelles: De Boeck.
Lessard, C., & et Tardif, M. (2004). *Les transformations actuelles de l'enseignement: trois scénarios possibles dans l'évolution de la profession enseignante ?* Bruxelles: De Boeck.
Maas, C. J. M., & Hox, J. J (2005). Sufficient sample sizes for multilevel modeling. *Methodology, 1*(3), 86–92.
Merini, C. (2007). Les dynamiques collectives dans le travail enseignant : du mythe à l'analyse d'une réalité. *Coordonner, collaborer, coopérer*. Bruxelles: De Boeck Supérieur.
Ministry of Education. (2008). Décret n° 2008-775 du 30 juillet 2008 relatif aux obligations de service et aux missions des personnels enseignants du premier degré.
Moss, G. (2013). Research, policy and knowledge flows in education: What counts in knowledge mobilisation. *Contemporary Social Science: Journal of the Academy of Social Sciences, 8*(3), 237–248.
Oakley, A. (2000). *Experiments in knowing: Gender and method in the social sciences*. Polity Press.
OECD. (2014). *TALIS 2013 results: An international perspective on teaching and learning*. TALIS: OECD.
Osborn, M. (2009). **Être élève en Angleterre et en France.** *Revue internationale d'éducation de Sèvres, 50*, 87–98. https://doi.org/10.4000/ries.521.
Perrenoud, P., et al. (2004). Les sciences de l'éducation proposent-elles des savoirs mobilisables dans l'action ? (dir.) In C. Lessard, et al. (Eds.), *Entre sens commun et sciences humaines*. Bruxelles: De Boeck.
Plaisance, E. (2019). Les sciences de l'éducation, des disciplines sur la corde raide : entre recherche et pratiques ?. *In Mabilon-Bonfils & Delory-Momberger. À quoi servent les sciences de l'éducation ?* ESF.
Pollard, A. (2005). *Reflective teaching in schools*. Bloomsbury.
Raulet-Marcel, C. (2019). Impliquer de futurs professeurs des écoles dans une démarche d'investigation scientifique. *Le français aujourd'hui, 204*, 111–123. n°.
Rey, O. (2013). *Décentralisation et politiques éducatives.Dossier d'actualité Veille et Analyses, n°83, avril*. ENS de Lyon.
Rose, J., Thomas, S., Zhang, L., Edwards, A., Augero, A., & Rooney, P. (2017). Research learning communities: Evaluation report and executive summary.
Sanchez, P. (2004). Defining corporate culture. *Communication World*, 18–21.
Sato, M, et al. (2014). Learning to Lead with Purpose: National Board Certifcation and Teacher Leadership Development. *International Journal of Teacher Leadership, 5*(1), 1–23.
Schleicher, A. (2012). *Preparing teachers and developing school leaders for the 21st century: Lessons from around the world*. OECD.
Scott, S., & McNeish, D. (2013). *School leadership evidence review: Using research evidence to support school improvement*. Department for Education.
Sebba, J., Tregenza, J., & Kent, P. (2012). Powerful professional learning: A school leader's guide to joint practice development. *National College for School Leadership*.
Shih, T.-H., & Fan, X. (2008). Comparing response rates from web and mail surveys: A meta-analysis. *Field Methods, 20*(3), 249–271.

Stoll, L., Bolam, R., McMahon, A., Wallace, M., & Thomas, S. (2006). Professional learning communities: A review of the literature. *Journal of Educational Change, 7*(4), 221–258.

Tardy, S., Canvel, A., Maestacci, V., Lhermet, P., & Gauthier, R.-G. (2018). La formation continue des enseignants du second degré. In *De la formation continue au développement professionnel et personnel des enseignants du second degré ? (No 2018068)*. IGEN, IGAENR.

Timperley, H., Kaser, L., & Halbert, J. (2014). A framework for transforming learning in schools: Innovation and the spiral of inquiry. In *Seminar series 234 (Centre for Strategic Education, Melbourne Victoria, Australia)*.

Timperley, H., & Robertson, J. (2011). Establishing platforms for leadership and learning. In J. Robertson, & H. Timperley (Eds.), *Leadership and Learning*. Sage.

Viau-Guay, A., et al. (2014). Les limites des dispositifs de développement de la réflexivité Contribution de l'analyse du travail à la formation initiale des enseignant(e)s (dir.). In Léopold Paquay, et al. (Eds.), *Travail réel des enseignants et formation* (pp. 127–139). Bruxelles: De Boeck.

Walker, J., Nelson, J., Bradshaw, S., & Brown, C. (2019). *Teachers' engagement with research: What do we know? A research briefing*. Education Endowment Foundation.

Watkins, M. W. (2018). Exploratory factor analysis: A guide to best practice. *Journal of Black Psychology, 44*(3), 219–246.