

Why is teacher change so hard in educational reforms?

¿Por qué el cambio docente es tan difícil en las reformas educativas?

Elizabeth Rosales Cordova¹ y Giovanna Moreano Villena²

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Resumen

Education reforms that aim to improve student learning usually employ strategies designed to promote teacher change. Despite sustained effort and investment in strategies for teacher change, it seems that educational reforms have had a limited impact on teachers and their pedagogical practices. One possible explanation is that these reforms base their strategies on a limited understanding of the process of teacher change. This theoretical essay clarifies the process of teacher change by analyzing six interconnected dimensions, thus proposing a comprehensive understanding of teacher change.

Palabras clave: educational change, teacher professional knowledge, beliefs, professional identity, emotions

Abstract

Las reformas educativas que apuntan a la mejora del aprendizaje estudiantil usualmente emplean estrategias diseñadas para promover cambios en los docentes. A pesar del esfuerzo sostenido y la inversión en estrategias para el cambio docente, pareciera que las reformas educativas han tenido un impacto limitado en los docentes y sus prácticas pedagógicas. Una posible explicación es que dichas reformas fundamentan sus estrategias en una comprensión limitada del proceso de cambio docente. El presente ensayo teórico contribuye a esclarecer el proceso de cambio docente a partir del análisis de seis dimensiones interconectadas, proponiendo así una comprensión integral del cambio docente.

Keywords: cambio educativo, conocimiento docente, creencias, identidad profesional, emociones

¹ Doctora en Educación por la Universidad de Toronto (Canadá), Investigadora independiente.

elizabethrosales@gmail.com  <https://orcid.org/0000-0002-8895-7637>

² Doctora en Educación por la Universidad de Michigan (Estados Unidos), Investigadora independiente.

gmoreano@gmail.com  <https://orcid.org/0000-0003-3289-497X>

Introduction

Clearly, educational reforms are designed to improve student learning. Our focus here is on those who advocate for pedagogies that place students at the center of the teaching-learning process, requiring teachers to implement thoughtful activities through which students can actively learn. This would include discouraging practices that emphasize rote learning, dictation, and memorization (Kennedy, 2005; Organization for Economic Co-operation and Development, 2012). However, after many years of implementing these reforms (which might include professional development, coaching, mentoring, and other activities), teachers still face challenges in engaging students in activities that allow them to build their learning (Kennedy, 2005). This paper calls for a better understanding of what is involved in teacher change within the context of educational reforms. It focuses on what brings about deep and enduring transformation in teacher practices, as well as which elements restrain teacher learning and change.

The analysis presented here focuses on reforms that address issues related to curriculum and teaching practices, as these are intrinsic to improving student learning. Commonly, these reforms are top-down, large-scale mandates designed by external authorities, referred to throughout this paper as “policymakers” and “reformers”. These reforms—in the course of their planning and implementation—can effectively prompt teacher change by examining the inner workings of teaching and teachers. This involves understanding that teaching is a complex intellectual decision-making process (Cochran-Smith & Fries, 2006; Kennedy, 2006) that occurs in contexts characterized by constant change (Ball & Cohen, 1999; Kennedy, 2005). Six dimensions of teacher change can be identified as aspects that might help clarify why teacher change is so hard to accomplish over the course of reform implementation. These dimensions are (1) teacher beliefs, (2) teacher knowledge, (3) teaching routines, (4) teacher emotions, (5) teacher identity, and (6) teacher agency.

These dimensions address how teachers' beliefs shape their practices, what knowledge is required to implement the school curriculum, and how regular routines might become an obstacle to reform. It is also recognized that the practice of teaching is an emotional endeavour (Sutton & Wheatley, 2003) and that reforms might trigger a variety of emotional responses among participants in implementing a given reform. Finally, since the practice of teaching is situated at the intersection of teachers' professional and personal lives (Connelly et al., 1997; Korthagen, 2004), it is argued here that teachers' identity and agency can be actualized and negotiated in the context of reforms. While literature is abundant in describing the implications of these dimensions for school reforms, teacher improvement, and student learning, they are rarely analyzed together. This analysis allows us to recognize how these dimensions are interconnected, making teacher change harder, especially when policymakers ignore their existence or only acknowledge one or some of them. By so doing, we remind reformers that teacher change is a dynamic process and that the changes reforms require cannot be superficial but must be both profound and responsive, since reforms can affect the most internal values involved in teaching.

This paper reviews empirical research and conceptual papers to provide a deeper examination of how educational reforms affect these six dimensions of change. Likewise, it shows how these dimensions are so intertwined that efforts to promote change might fail if they are not addressed together in the course of implementing reforms. While examining these dimensions shows that enacting change is never easy, it does not suggest that it is impossible. Rather, this paper advocates for thoughtful actions that can create enduring teacher transformation. A quick aside: although teacher change involves social and contextual factors, such as collegiality, collaboration, and school resources, these are not the focus of this paper. Nonetheless, their roles in teacher learning are acknowledged.

Development of the work

Change requires strong and solid teacher knowledge

Reforms require teachers to master the content they teach, make content understandable for students, organize the content in the curriculum to ensure that students are building their learning, as well as use a variety of other skills related to meaningful teaching. These requirements become more challenging and demanding for teachers compared to the types of knowledge they used to apply. For example, the curriculum reform in mathematics advanced by the National Council of Teachers of Mathematics (2002, 2014) proposed departing from procedural knowledge, which had been the basis of mathematics teachers' knowledge, in favor of a more sophisticated teacher knowledge that emphasized conceptual knowledge, reasoning, and representation. Likewise, emphasis on computational skills was reduced from the curriculum, and more advanced topics in geometry, measurement, and functions were included. Instruction of reading, science, and other curricular domains was also reformed in an effort to expand student understanding and to make learning more meaningful. As a consequence, teachers have also been expected to expand their knowledge for teaching. Given that teaching is no longer telling (Smith, 1996), teachers need to reconceptualize their ideas about teaching and learning. Therefore, a reconfiguration of teachers' knowledge is required to create supportive conditions for the reform implementation and to facilitate meaningful teacher change.

Current reforms, given the standards of modern instruction, demand specialized teachers to improve student learning. As previously mentioned, the reforms, particularly those inspired by socio-constructivism, consider both the teacher and student perspectives throughout the teaching-learning process. Such a process takes place in a social context in which teachers must monitor learning while providing educational opportunities for students to construct meaning. On their part, students bring to this process their skills, prior knowledge, and motivation, all of which will shape the outcomes (Fenstermacher & Richardson, 2005). From this perspective, teacher knowledge goes beyond simply mastering content.

The implementation of reforms required a wider and deeper understanding of teacher knowledge. As a consequence, discussions about new domains started appearing in the literature. Such domains were recognized as those required to ensure effective instruction and learning. Shulman (1986) developed a taxonomy of such knowledge: (1) content knowledge, or knowledge of the content to be taught; (2) pedagogical content knowledge (PCK), or the knowledge needed to make that content understandable to novices; and (3) curricular knowledge, or teachers' familiarity with the materials that are needed for instruction. This classification expanded the traditional demands for teacher knowledge, which focused on the domain of subject content, and shed light on how teacher knowledge plays a role in changing teaching practices and influencing student learning (Gess-Newsome et al., 2019). This taxonomy is still relevant because it highlights the importance of knowing learning requirements, students' misconceptions, and instructional strategies (examples, models, representations, etc.) Indeed, PCK still demands a strong subject matter, given that without it, teachers will hardly "learn powerful strategies and techniques for representing the subject to students and for attending and responding to students' thinking about the subject in ways that help support their meaningful learning" (Borko & Putnam, 1996, p.700).

It follows that teachers need to know more than just a set of techniques or isolated pieces of content to put new reforms into practice. There are many domains of knowledge, and each of them has its own purpose and focus. Such complexity should be considered for any reform program to effectively build strong and solid teacher knowledge. If programs and interventions for reform implementation address only some of these domains, teachers will be unable to determine the best ways to approach student learning.

Teacher change disrupts established routines

Discussions about teacher change often downplay how routinized teaching can be (Feldon, 2007; Nuthall, 2005). Routines aid teachers' thinking and decision-making, helping them handle the unpredictability of classroom life. Commonly, reforms demand that teachers adopt new and different practices. However, even when teachers show openness to change, they may support the new reforms' practices with old routines. Cohen (1990) illustrates this fact by presenting the Mrs. Oublier case. After four years of implementing a student-centered mathematics curriculum, she was convinced that she had changed her teaching according to what was prescribed, but her instructional techniques were still strongly teacher-centered. For example, students only participated when she asked questions, and they did not have the chance to explain or discuss their answers. Cohen's (1990) analysis showed that Mrs. Oublier used routines that facilitated her instruction according to her old ideas about mathematics teaching, which allowed her to maintain "direction, content, and pace" (p. 322) in her instruction.

Cohen's (1990) findings caution policymakers that teachers already have their own ways to teach, and that their pedagogical repertoire is mainly formed by routines. These can be defined as sequences of actions or procedures that provide teachers with a sense of control to manage the complexity of classroom life (Yinger, 1979). According to Huberman (1983), immediacy, simultaneity, and unpredictability are characteristics of the complex classroom ecology that lead teachers to develop routines to meet instructional goals. In the same vein, Kennedy (2006) elaborates on the simultaneous nature of teaching by arguing that many agendas need to be managed during class time: "(a) covering desirable content, (b) fostering student learning, (c) increasing students' willingness to participate, (d) maintaining lesson momentum, (e) creating a civil classroom community, and (f) attending to their own cognitive and emotional needs." (p. 205). In this complex classroom life, routines aid teachers' thinking and interactions by helping to prevent cognitive overload, which could emerge from dealing with the unpredictability and simultaneity described by Huberman (1983) and Kennedy (2006). This is because routines help teachers to access automatic thinking, which allows them to make quick decisions and guide their behavior (Feldon, 2007).

Teachers and students have learned to live with routines, given their near omnipresence (Kelemanik et al., 2016). They are part of classroom culture and provide "the basis on which teacher and students understand and can predict each other's expectations and actions" (Nuthall, 2005, p. 925). Going back to the Mrs. Oublier example (Cohen, 1990), both the teacher and students knew what their roles in class were: the teacher initiated every instructional interaction and the students' role was to answer. Since this predictability was helpful for Mrs. Oublier and her students, these routines served as the foundation upon which Mrs. Oublier constructed the "new" pedagogical practices proposed by the student-centered reform. This clearly illustrates that altering established routines is not a simple endeavor. That said, recent research on discourse routines in the classroom suggests that meaningful transformation is indeed possible. Rees and Roth (2019) found that after a five-month professional development program using co-teaching as the main strategy, teachers adopted student-centered discourse routines (such as asking questions specifically designed to expand students' thinking) that fostered scientific inquiry in the classroom.

Other researchers, such as Sherin (2002), have highlighted that routines are composite structures of knowledge, allowing teachers to associate pedagogical schemes with specific content. This facilitates teachers' planning and also provides them with a sense of whether the learning goals are being achieved. For example, in math lessons, a teacher might include a teaching routine that involves practicing computational skills (such as multiplication worksheets) well known to the students, which might help lessons run smoothly. The teachers could simply assume that real learning was taking place.

It follows that routines can't be overlooked, given how deeply embedded they are in teachers' mindsets and classroom life. Gorodetsky and Barak (2009) point out that "major barriers towards school

change are rooted in the hidden, implicit aspects of daily school life that are taken for granted. These constitute the school's taken-for-granted routines, which mold teachers' affordances and constraints within the school, without their awareness" (p. 585). This quote doesn't suggest that routines should be eliminated from teachers' repertoire to prompt change, nor that this should be the purpose of reforms. In fact, almost all teaching, even reform-oriented pedagogy, is sustained by routines. As Kennedy (2005) argues, routines make teaching sustainable because they enable teachers to respond to several demands without becoming bewildered by them. It makes sense, therefore, that rather than decrying the ubiquity of routines in teaching, those responsible for implementing reforms should focus on helping teachers become aware of both the routines' presence and their effects on students' learning. Indeed, reforms should help teachers to develop different routines that allow them to support their instructional efforts within the exigencies of the new paradigm being proposed.

Teacher change involves changing teachers' beliefs

Reforms require teachers to adopt different practices which, as has been argued by an abundance of literature, might involve embracing different views or beliefs about education, teaching, and learning (Buehl & Beck, 2015; Hutner & Markman, 2016; Pajares, 1992). This demand represents an obstacle for reformers; beliefs are hard to change because they are rooted in teachers' experiences, including their own experiences as school students (Fives & Buehl, 2012; Pajares, 1992). Moreover, beliefs work as filters for any reform message, shaping teachers' interpretations of it. Thus, any attempt to introduce new practices in teachers' repertoire requires attention to teachers' beliefs (Spillane et al., 2018).

Teachers' belief systems are "instrumental in defining tasks and selecting the cognitive tools with which to interpret, plan, and make decisions regarding such tasks; hence, they play a critical role in defining behavior and organizing knowledge and information" (Pajares, 1992, p.325). This definition reveals two characteristics that make beliefs crucial for teaching: (1) beliefs determine how teachers interpret, decide, and act in classrooms, and (2) they determine the ways teachers use knowledge and information for teaching. In other words, beliefs support teachers' cognitive work by filtering interpretation, framing problems, and guiding action (Fives & Buehl, 2012; Hutner & Markman, 2016).

Beliefs are organized in systems to support teachers' thinking. In such systems, beliefs are interconnected; with some beliefs existing at the center of the system, while others lie at the periphery (Borg, 2018; Fives & Buehl, 2012; Hoy et al., 2006; Hutner & Markman, 2016). The organization in systems might explain why beliefs are stable and hard to change. It also helps to understand the level of appropriation and consequent execution of reforms in the classroom (Thompson, 1992). For instance, the new information might be incorporated into a belief system with little examination by the teachers, and thus remains peripheral in the system without positively affecting the teachers' core beliefs. In such a case, teachers could conduct their lessons without much change or innovation expected by reforms, or they could create hybrid practices. Consequently, the implementation of lessons would look very different from what was intended by the reform.

In this line, the case of Mrs. Oublier, studied by Cohen (1990), reveals how teachers cognitively process reforms and how they put them into practice. As mentioned earlier, this research showed that, despite believing her teaching had changed to meet the reform's requirements, she implemented her teaching practice in ways that revealed a different reality. According to classroom observations, she used the curriculum as suggested by the reform, presenting novel activities and using concrete materials. However, she continued to conduct her lessons relying on drills, asking mainly straightforward questions, and overlooking opportunities for students to explain their answers. Cohen (1990) concluded that she had made sense of the reform by integrating the new and old mathematics into her belief system. This case sheds light on how teachers' beliefs shape their interpretations of the reforms, to the point of impeding the assimilation of the new beliefs.

It is also important to consider that although teachers' beliefs support teachers' cognitive processes and orient their practice, not all beliefs simultaneously play a role in teachers' mental processes. In other words, not all the beliefs a teacher holds are enacted. Research suggests that only some beliefs become active in any given circumstance to guide action (Fives et al., 2015; Fives & Buehl, 2012; Hutner & Markman, 2016). Which beliefs become active? The ones that are more important to the teacher are more frequently used and are connected to frequently used beliefs (Hutner & Markman, 2016). In addition, a belief can only be enacted if the teacher holds sufficient knowledge to transform an idea into reality (Buehl & Beck, 2015). Finally, context also plays a key role in the activation of beliefs. Teachers assess their environments to determine how a belief pragmatically serves to address a situation at hand (Fives et al., 2015; Fives & Buehl, 2012; Hamilton, 2018). In sum, teachers' beliefs alone cannot explain teachers' practice: the activation of specific beliefs, the supporting knowledge needed, and the contextual elements all play a role in the enactment of beliefs.

It follows that, if the reform goal is to transform teachers' practices to improve student learning, it is essential to have a deep understanding of teachers' belief systems. By extension, reform strategies need to consider changes in beliefs, for example, through professional development that offers opportunities for teachers to self-reflect on their beliefs about teaching and learning. It is important to highlight that changing beliefs in isolation might not assure the desired changes in practices (Borg, 2018).

Teacher change has an emotional component

Reform efforts that aim at changing teaching elicit strong emotional responses because they set new expectations and roles that teachers need to incorporate into their work. These changes might provoke them to feel insecure and threatened, given that their sense of professionalism is at stake. Therefore, implementing new curricula and pedagogies might be considered, in the words of Cross and Hong (2009), "an emotionally laborious and challenging process" (p. 273). Alternatively, teachers could feel pleased and enthusiastic, especially if they are confident about successfully attaining reform goals. Given the wide range of emotions that arise during the process of implementing reforms, there is a growing academic community calling for the scrutinizing of the role of emotions when examining teacher change. These researchers point out that emotions play as important a role as the cognitive domain when teachers are attempting to make sense of reforms (Saunders, 2013; van Veen & Slegers, 2009; Xu et al., 2021; Zembylas, 2010).

Emotions can be described as "the product of the appraisal of those environmental events that are perceived as most relevant to the individual's goals and wellbeing" (van Veen & Slegers, 2009, p. 236). Educational reforms are significant environmental events because they usually propose new instructional regulations (Smith, 1996; Xu et al., 2021)—a different pedagogical repertoire, more complex content to teach, different routines, and new perspectives on teaching, to name a few. The encounter with these new regulations for teaching prompts emotional responses that are part of teachers' process of making sense of reforms. For example, negative emotions might emerge if reforms promote only one way of teaching when teachers are demanding plurality (van Veen & Slegers, 2009). Likewise, teachers might perceive the reforms' goals as broad, vague, and ambitious, which could result in them feeling confused and overburdened (van Veen & Slegers, 2009). Strong emotional responses in these initial encounters might result in the teachers' first blockade to change. As teachers assess the goals of the reform and anticipate that these changes "are more likely to bring emotional pain than pleasure, they [teachers] are less likely to adopt and use these strategies" (Sutton & Wheatley, 2003, p. 346).

Moreover, it should be noted that reforms "activate" a complex web of interactions between knowledge, beliefs, identity, and practice, which trigger emotional responses (Chen, 2020). As teachers make sense of the reforms, they identify the elements at stake in the proposed changes by comparing their current practices with what the reform requires. This comparison touches on their own beliefs and knowledge about teaching and, at a deeper level, it involves how teachers define themselves (Zembylas,

2010). We elaborate more on this in the following section. If the reform demands align with teachers' identities and classroom practices, positive emotions, such as enthusiasm and happiness, could emerge. Teachers might even feel validated because their usual practice is being promoted for the benefit of others. On the other hand, if the demands require new ideas and practices that clash with teachers' identities, it could elicit fear and insecurity (Bruce & Ross, 2008).

Research has provided some evidence of this interaction, where emotions become central. For instance, Bruce and Ross (2008) found that teachers who participated in an intensive program emphasizing conceptual understanding initially feared being involved in a different pedagogy. The authors analyzed the case of Laura. They found that learning about content knowledge and pedagogical content knowledge negatively affected her. Her self-image was diminished because she was made aware of her limitations and weaknesses. In fact, the researchers observed that "confidence initially declined because her aspiration level increased faster than her ability to meet it" (p. 360). This case depicts how reforms might leave teachers with a feeling of powerlessness or vulnerability, as they assess their knowledge and beliefs against the reform demands (Zembylas, 2010). In this scenario, teachers might choose to maintain the instructional practices they are familiar with rather than risk failure by trying new ones.

Given that the implementation of educational reforms involves an emotional endeavor, it is necessary to place emotions at the forefront of the change process and offer teachers the emotional safety needed to explore the new ideas proposed by the reforms (Saunders, 2013; Zembylas, 2010). Being emotionally supported and having space to cope with change might actually prompt teachers to initiate change themselves. For instance, as Saunders (2013) suggests, professional development programs delivered in the reform context should include time to allow teachers to discuss with their colleagues their feelings of anxiety, anguish, and trepidation associated with the reforms. Ignoring the fact that teachers need to make emotional sense of the reform-mandated changes might also prevent reformers from acknowledging the importance of teachers' identity and agency in implementing new pedagogies. This is addressed in the following sections.

Teacher change affects teacher identity

Based on what has been discussed to this point, it is possible to claim that implementing reforms often requires a re-negotiation of teachers' identities. Teacher identity refers to the "framework for teachers to construct their own ideas of 'how to be', 'how to act' and 'how to understand' their work and their place in society" (Sachs, 2005, p. 15). Because reform proposals often advocate for teachers to adopt new or different pedagogical practices and to take on new roles, self-image and identity are at stake in the process of change (Hendrikx, 2020; Zembylas, 2010). That explains why teacher change is difficult: it involves re-negotiating core aspects that define who they are.

Even though the re-negotiation process of teachers' identities is ongoing and is part of teachers' development and growth (Beck & Kosnik, 2014; Sachs, 2005), reform proposals exert an external pressure to direct the change process in a predetermined direction (Hendrikx, 2020). In this scenario, teachers examine reform proposals based on their views of how to be, act, and understand teaching, and take a stance on the advocated change. A review of studies on teachers' identities in the context of reforms (Bower & Parsons, 2016; Buchanan, 2015; Hall & McGinity, 2015) has represented teachers' stances vis-à-vis reform implementation on a continuum from believer-compliant to opposer-resistant. Teachers who position themselves at the believer-compliant end of the continuum follow the mandates of the reform because they consider this could bring about positive change for them and their students (Bower & Parsons, 2016; Buchanan, 2015; Hall & McGinity, 2015). Sometimes, reform proposals align with how teachers view themselves or their core beliefs about teaching a specific subject. On the other end, teachers in the opposer-resistant position critique the reform ideas and find ways to modify or resist the

reforms in their classrooms (Bower & Parsons, 2016). This type of response arises from a clash between teachers' identities and the reform proposals.

Interestingly, teachers at all points along the continuum adjust the reform mandates to their practices based on what works for them and their students. Teachers at the believer-compliant end still alter the reform mandates to a certain degree, but they nonetheless present an appearance of compliance (Bower & Parsons, 2016). Teachers who position themselves at the opposer-resistant end of the continuum openly critique the reform and are vocal about the modifications that they have made to the mandates (Bower & Parsons, 2016).

These studies provide evidence of how teachers' identities are at stake in the context of reforms: reconciling reform proposals with teachers' identities requires an active adaptation of reform goals. In the case of managerial and accountability reforms, evidence has shown a negative impact on teachers' identities, reducing their sense of autonomy and general well-being (Skinner et al., 2019). This suggests that reform efforts could be more successful if teachers have the power to make decisions about their practice and implement the reform goals in their classrooms. As argued in the next section, teachers' ownership of the process of change is central to the successful implementation of reform efforts.

Teacher change depends on teachers' agency because change is intentional

Teacher agency plays an important role in educational change. As Day (1999) argued, "change at deeper sustained levels involves the modification or transformation of values, attitudes, emotions, and perceptions which inform practice, and these are unlikely to occur unless there is participation in a sense of ownership of the decision-making change processes" (p. 98). How this sense of ownership of change is defined and activated by reforms is fundamental to understanding both the success and failure of reforms.

In this paper, this sense of ownership is addressed by the concept of agency. This concept has been developed by diverse approaches: teacher agency could be understood as teachers' personal characteristics (Pyhältö et al., 2014) or as teachers' behaviors or actions (Biesta et al., 2015; Vähäsantanen, 2015). Likewise, going beyond the individual teacher, agency can be understood from an ecological perspective (Priestley et al., 2012). This paper follows the conceptualization of teachers' agency developed by Imants and Van der Wal (2020) because it integrates this personal approach with the ecological perspective. According to these authors, teachers exert their agency in response to a context. That is, teacher agency is enacted as teachers make choices and decisions, take stances, and modify their work within particular contexts. To understand the role of teacher agency in school-reform scenarios, we need to examine three aspects of reforms: (1) a passive or active role of teachers in the reform, (2) a flexible or fixed position regarding the content of reform, and (3) an end-result or ongoing-process conceptualization of change (Imants & van der Wal, 2020). These aspects are relevant to examining reform characteristics and their impact on teachers' agency. In particular, the second aspect is connected to the concept of identity elaborated in the previous section. Negotiating reform proposals into teachers' regular practice and identity requires some room for dynamic adaptation. The level of flexibility of reform content is key to how successfully this negotiation process can be facilitated. This is of crucial significance if reforms are to create lasting change.

It is necessary to look at reform characteristics to understand how teachers enact their agency. For example, top-down prescriptive reforms might lead teachers to become critical, work on maintaining the status quo or resisting change (Bridwell-Mitchell, 2015; Priestley et al., 2012; Pyhältö et al., 2014; Vähäsantanen, 2015). Reforms promoting a prescriptive curriculum, standardized student evaluations, higher student achievement, and closer inspections of lessons might end up eroding teacher agency (Priestley et al., 2012). These reform strategies usually provoke negative reactions because they constrain teachers' autonomy and inspiration. According to Imants and Van der Wal (2020), these strategies give

teachers a passive role in reform implementation, and position the content of reform (for example, pedagogical practices) as imposed from above, and to be adopted with little room for adaptation.

Conversely, reforms that offer leeway for implementation may lead teachers to enact their agency towards transformation (Bridwell-Mitchell, 2015; Pyhältö et al., 2014; Vähäsantanen, 2015). Flexible policies with space for teachers' active participation and influence could foster teachers' agency towards change (Datnow, 2020; Vähäsantanen, 2015). Teachers' engagement in reform efforts stems from recognizing teachers as agentic actors who possess valid and relevant knowledge to adapt the reform content (Imants & van der Wal, 2020). Given the significance of teacher agency, the efforts to promote teacher change should provide teachers with help identifying the need for change, as well as in examining their own role in transforming their practices. Reform strategies—such as creating communities of learning/practice, teacher-peer learning, providing feedback on pedagogical practices, and involving teachers in school decision-making about implementing reforms in their local contexts—are essential in developing a sense of agency and shared responsibility regarding student learning (Wilcox & Lawson, 2018).

These strategies are important: in their study, Pyhältö et al. (2014) found that “perceiving themselves as active professional agents in terms of school reform [does] not automatically mean that teachers [engage] in the educational change without doubts and criticisms” (p.319). Teachers need opportunities to understand reforms and gather evidence that the practices proposed by these reforms could lead to improved student learning. This concept connects with the third aspect reported by Imants and Van der Wal (2020) regarding the end-result or ongoing-process conceptualization of change by reforms. According to these authors, teachers assess the outcomes of the reform implementation in an ongoing fashion, based on evidence from their classroom experiences and their students' learning. Teachers use this information to make decisions about whether or not to continue reform implementation. It is clear that reforms promoting a conceptualization of change as an ongoing and cyclical process could strengthen teachers' agency by offering them opportunities to make choices and decisions about progressively adapting and implementing these reform innovations.

Conclusions

In an effort to understand what is involved in teacher change in the context of reforms, this paper has shed light on teachers and teaching, by describing how their beliefs, knowledge, routines, emotions, identity, and agency are at play when they face a new educational mandate or policy. As argued, reformers have often overlooked these dimensions when implementing new plans. It mainly occurs when programs adopt a top-down approach, which enforces policymakers' ideals about teaching, pedagogies, and strategies on those implementing the curriculum daily. The underlying expectation is that teachers embrace such ideals, pedagogies, and strategies, and then put them into practice, thus leading to improvement in student learning. This approach to educational reforms has long been challenged (Tyack & Cuban, 1995) because it assumes that schools and teachers are blank slates: reformers believe they can imprint the ideals and pedagogies in teachers' minds, presuming the desired outcome will occur. However, as argued throughout this paper, even when teachers agree and are interested in implementing a new educational paradigm, new ideals or pedagogies, they face (1) the complexity of teaching (Kennedy, 2006), (2) the reality of classrooms dynamics (Kennedy, 2005), and (3) the multiple competing goals and limited resources of the classroom setting (Jenssen et al., 2014). Teachers and the inherent complexity of teaching should not be overlooked when striving to achieve the desired outcomes. In light of the evidence presented in the previous sections, this paper concludes with ideas that will hopefully encourage a different approach to implementing educational reforms affecting teachers and teaching.

Teacher change is an ongoing process; thus, educational reforms need to offer several opportunities for teachers to engage with the proposed pedagogies. Researchers have been long claiming that teacher change should be understood as a process (Clarke, 2007; Day, 1999; Guskey, 1986). As the evidence presented in the previous sections suggest, “change is gradual, difficult, and often a painful process” (Clarke, 2007. p. 38). Nevertheless, many policymakers expect change to manifest not long after the conclusion of teacher development programs. While extended duration has been recognized as a key aspect of effective professional development (Desimone, 2009), research reviewed in this paper suggests that the way change is conceptualized by reforms might be even more important. An end-result vs an ongoing-process conceptualization of change (Imants & van der Wal, 2020) affects how teachers engage and relate to the proposed pedagogies. Reform design based on an ongoing-process approach includes multiple professional development strategies for teachers to engage, experiment, and reflect upon when implementing the pedagogies proposed. Having several opportunities over time aids sustained change because it helps teachers gradually include and observe the effects on their teaching practice and student learning. This feedback loop is needed to challenge persistent prior beliefs and knowledge.

In the context of reforms, teacher change begins with a process of making sense of the reforms’ ideals. Research reviewed in previous sections points to the importance of teachers’ first encounters with reforms. In these initial interactions, teachers recognize reforms’ new expectations and the implications for their own work. As teachers attempt to understand what the reform is about, a complex web of beliefs, knowledge, and emotions comes into play. Here, it is important to recall that teachers interpret reform’s new ideals, pedagogies, or strategies from their own experience. That is, teachers read the reform proposals from their current beliefs and knowledge about teaching. By comparing what is asked for in the reforms and their current practice, teachers experience emotions related to either rejection or approval. At its core, this sense-making process touches on teachers’ identities. This is because reforms exert external pressure for specific changes that might not be aligned with teachers’ previous experience, beliefs or knowledge regarding instruction. Informed by their initial experiences, teachers take a stand (grounded on their identities) in relation to reforms, and this in turn can determine how easy or difficult the transition to the new ideals, pedagogies, or strategies advocated by the reforms can be.

Given the importance of this sense-making process, policymakers need to be explicit about how the proposed change could lead to positive outcomes and improved student learning. Offering clear evidence about what the new practices look like in real classrooms and the potential impact on student learning would be a good start. Teachers need to be convinced that trying something new is worth the time required to acquire new knowledge, the emotional effort involved in experimenting, and the re-negotiation of their identities.

A sense of ownership needs to be a central concern of policymakers, so that proposed pedagogies become part of teachers’ regular practice. Adaptation of reforms’ pedagogies and strategies should be part of teachers’ initial experimentation with reforms. Gradually, teachers take ownership of the reforms by contextualizing the advocated pedagogies and strategies within their local environments, considering the characteristics of the student body, and utilizing the resources at hand. Reforms that offer space for these adjustments are, in fact, strengthening teachers’ sense of agency and facilitating the re-negotiations of their identities. This is of paramount importance in order for change to be sustained over time.

Another key element in sustaining change is offering direct support to teachers to help them adopt the new pedagogies and strategies. Funding for school-based professional development (through mentoring or communities of practice) and for useful resources to implement the reforms can help teachers in the change process. Without these supports, initial experimentation with reforms can hardly be incorporated into the teaching repertoire.

Moreover, school-based professional development can help build shared responsibility for student learning and success at the school level. With proper support, individual change could be part of a larger

movement for educational transformation. For example, having spaces to share the emotional and pedagogical challenges of implementing the reform could be valuable in encouraging successful change. Later in the process, these spaces could become platforms for exhibiting successful experiences or exemplary practices. Involving teachers this way recognizes them as the main agents of educational reforms. In fact, reforms will not succeed unless teachers actively participate in such reforms (Kennedy, 2005).

Teacher change is hard, but not impossible. Policymakers envisioning the next wave of educational reforms need to be aware of the complexities underlying the teaching profession. This awareness is crucial for designing strategies that acknowledge teacher beliefs, routines, and emotions while simultaneously enhancing teachers' agency. The dimensions discussed above need to be addressed as a high priority, considering that teacher change is not an event that occurs after professional development but is a process involving teachers making sense of the reform's underlying principles. Teacher change should not be understood as teachers following reform mandates but as professionals developing a sense of ownership in transforming practices. All these considerations could pave the way for sustained change.

References

- Ball, D. L., & Cohen, D. K. (1999). Developing practice, developing practitioners: Toward a practice-based theory of professional education. In L. Darling-Hammond & G. Sykes (Eds.), *Teaching as the learning profession* (pp. 3–32). Jossey-Bass.
- Beck, C., & Kosnik, C. (2014). *Growing as a teacher: Goals and pathways of ongoing teacher learning*. Sense Publishers. <https://doi.org/10.1007/978-94-6209-560-1>
- Biesta, G., Priestley, M., & Robinson, S. (2015). The role of beliefs in teacher agency. *Teachers and Teaching: Theory and Practice*, 21(6), 624–640. <https://doi.org/10.1080/13540602.2015.1044325>
- Borg, S. (2018). Teachers' beliefs and classroom practices. In P. Garrett & J. M. Cots (Eds.), *The Routledge handbook of language awareness* (pp. 75–91). Routledge. <https://doi.org/10.4324/9781315676494-5>
- Borko, H., & Putnam, R. T. (1996). Learning to teach. In D. C. Berliner & R. C. Calfee (Eds.), *Handbook of educational psychology* (pp. 673–708). MacMillan.
- Bower, H. A., & Parsons, E. R. C. (2016). Teacher identity and reform: Intersections within school culture. *The Urban Review*, 48(5), 743–765. <https://doi.org/10.1007/s11256-016-0376-7>
- Bridwell-Mitchell, E. N. (2015). Theorizing teacher agency and reform: How institutionalized instructional practices change and persist. *Sociology of Education*, 88(2), 140–159. <https://doi.org/10.1177/0038040715575559>
- Bruce, C. D., & Ross, J. A. (2008). A model for increasing reform implementation and teacher efficacy: Teacher peer coaching in grades 3 and 6 mathematics. *Canadian Journal of Education*, 31(2), 346–370. <http://www.jstor.org/stable/20466705>.
- Buchanan, R. (2015). Teacher identity and agency in an era of accountability. *Teachers and Teaching*, 21(6), 700–771. <https://doi.org/10.1080/13540602.2015.1044329>
- Buehl, M. M., & Beck, J. S. (2015). The relationship between teachers' beliefs and teachers' practices. In H. Fives & H. G. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 66–84). Taylor & Francis.
- Chen, J. (2020). Refining the teacher emotion model: Evidence from a review of literature published between 1985 and 2019. *Cambridge Journal of Education*, 51(3), 1–31. <https://doi.org/10.1080/0305764X.2020.1831440>
- Clarke, D. (2007). Ten key principles from research for the professional development of mathematics teachers. In G. C. Leder & H. J. Forgasz (Eds.), *Stepping stones for the 21st century: Australasian mathematics education research* (pp. 27–39). Sense Publishers. https://doi.org/10.1163/9789087901509_004

- Cochran-Smith, M., & Fries, K. (2006). Researching teacher education in changing times: Politics and paradigms. In M. Cochran-Smith & K. Zeichner (Eds.), *Studying teacher education: The report of the AERA panel on research and teacher education* (pp. 69–109). Lawrence Erlbaum Associates.
- Cohen, D. K. (1990). A revolution in one classroom: The case of Mrs. Oublier. *Educational Evaluation and Policy Analysis*, 12(3), 311–329. <https://doi.org/10.3102/01623737012003311>
- Connelly, F. M., Clandinin, D. J., & He, M. F. (1997). Teachers' personal practical knowledge on the professional knowledge landscape. *Teaching and Teacher Education*, 13(7), 665–674. [https://doi.org/10.1016/S0742-051X\(97\)00014-0](https://doi.org/10.1016/S0742-051X(97)00014-0)
- Cross, D. I., & Hong, J. Y. (2009). Beliefs and professional identity: Critical constructs in examining the impact of reform on the emotional experiences of teachers. In P. Schutz & M. Zembylas (Eds.), *Advances in teacher emotion research* (pp. 273–296). Springer. https://doi.org/10.1007/978-1-4419-0564-2_14
- Datnow, A. (2020). The role of teachers in educational reform: A 20-year perspective. *Journal of Educational Change*, 21(3), 431–441. <https://doi.org/10.1007/s10833-020-09372-5>
- Day, C. (1999). *Developing teachers: The challenges of lifelong learning*. Routledge.
- Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher*, 38(3), 181–199. <https://doi.org/10.3102/0013189X08331140>
- Feldon, D. F. (2007). Cognitive load and classroom teaching: The double-edged sword of automaticity. *Educational Psychologist*, 42(3), 123–137. <https://doi.org/10.1080/00461520701416173>
- Fenstermacher, G., & Richardson, V. (2005). On making determinations of quality in teaching. *Teachers College Record*, 107(1), 186–213. <https://doi.org/10.1111/j.1467-9620.2005.00462.x>
- Fives, H., & Buehl, M. M. (2012). Spring cleaning for the “messy” construct of teachers' beliefs: What are they? Which have been examined? What can they tell us? In K. R. Harris, S. Graham, T. Urdan, S. Graham, J. M. Royer, & M. Zeidner (Eds.), *APA educational psychology handbook, Vol. 2. Individual differences and cultural and contextual factors* (pp. 471–499). American Psychological Association. <https://doi.org/10.1037/13274-019>
- Fives, H., Lacatena, N., & Gerard, L. (2015). Teachers' beliefs about teaching (and learning). In H. Fives & H. G. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 249–265). Taylor & Francis. <https://doi.org/10.4324/9780203108437>
- Gess-Newsome, J., Taylor, J. A., Carlson, J., Gardner, A. L., Wilson, C., & Stuhlsatz, M. (2019). Teacher pedagogical content knowledge, practice, and student achievement. *International Journal of Science Education*, 41(7), 944–963. <https://doi.org/10.1080/09500693.2016.1265158>
- Gorodetsky, M., & Barak, J. (2009). Back to schooling: Challenging implicit routines and change. *Professional Development in Education*, 35(4), 585–600. <https://doi.org/10.1080/19415250903000990>
- Guskey, T. R. (1986). Staff development and the process of teacher change. *Educational Researcher*, 15(5), 5–12. <https://doi.org/10.3102/0013189X015005005>
- Hall, D., & McGinity, R. (2015). Conceptualizing teacher professional identity in neoliberal times: Resistance, compliance and reform. *Education Policy Analysis Archives*, 23(88). <https://doi.org/10.14507/epaa.v23.2092>
- Hamilton, M. (2018). Pedagogical transitions among science teachers: How does context intersect with teacher beliefs? *Teachers and Teaching*, 24(2), 151–165. <https://doi.org/10.1080/13540602.2017.1367658>
- Hendriks, W. (2020). What we should do vs what we do: Teachers' professional identity in a context of managerial reform. *Educational Studies*, 46(5), 607–623. <https://doi.org/10.1080/03055698.2019.1620694>
- Hoy, A. W., Davis, H., & Pape, S. J. (2006). Teacher knowledge and beliefs. In P. A. Alexande & P. H. Winne (Eds.), *Handbook of educational psychology* (pp. 715–737). Lawrence Erlbaum Associates Publishers.

- Huberman, M. (1983). Recipes for busy kitchens: A situational analysis of routine knowledge use in schools. *Knowledge*, 4(4), 478–510. <https://doi.org/10.1177/0164025983004004002>
- Hutner, T. L., & Markman, A. B. (2016). Proposing an operational definition of science teacher beliefs. *Journal of Science Teacher Education*, 27, 675–691. <https://doi.org/10.1007/s10972-016-9480-5>
- Imants, J., & van der Wal, M. M. (2020). A model of teacher agency in professional development and school reform. *Journal of Curriculum Studies*, 52(1), 1–14. <https://doi.org/10.1080/00220272.2019.1604809>
- Jenssen, F., Westbroek, H., & Doyle, W. (2014). The practical turn in teacher education: Designing a preparation sequence for core practice frames. *Journal of Teacher Education*, 65(3), 195–206. <https://doi.org/10.1177/0022487113518584>
- Kelemanik, G., Lucenta, A., & Creighton, S. J. (2016). *Routines for reasoning*. Heinemann.
- Kennedy, M. (2005). *Inside teaching: How classroom life undermines reform*. Harvard University Press. <https://doi.org/10.4159/9780674039513>
- Kennedy, M. (2006). Knowledge and vision in teaching. *Journal of Teacher Education*, 57(3), 205–211. <https://doi.org/10.1177/0022487105285639>
- Korthagen, F. (2004). In search of the essence of a good teacher: Towards a more holistic approach in teacher education. *Teaching and Teacher Education*, 20, 77–97. <https://doi.org/10.1016/j.tate.2003.10.002>
- National Council of Teachers of Mathematics. (2002). *Principles and standards for school mathematics*. <https://www.nctm.org/standards/>
- National Council of Teachers of Mathematics. (2014). *Principles to action: Ensuring mathematical success for all*. <https://www.nctm.org/PtA/>
- Nuthall, G. (2005). The cultural myths and realities of classroom teaching and learning: A personal journey. *Teachers College Record*, 107(5), 895–934. <https://doi.org/10.1111/j.1467-9620.2005.00498.x>
- Organization for Economic Co-operation and Development. (2012). *Preparing teachers and developing school leaders for the 21st century: Lessons from around the world*. OECD Publishing. <https://doi.org/10.1787/9789264174559-en>
- Pajares, F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research*, 62(3), 307–332. <https://doi.org/10.3102/00346543062003307>
- Priestley, M., Edwards, R., Priestley, A., & Miller, K. (2012). Teacher agency in curriculum making: Agents of change and paces for manoeuvre. *Curriculum Inquiry*, 42(2), 191–214. <https://doi.org/10.1111/j.1467-873X.2012.00588.x>
- Pyhältö, K., Pietarinen, J., & Soini, T. (2014). Comprehensive school teachers' professional agency in large-scale educational change. *Journal of Educational Change*, 15, 303–325. <https://doi.org/10.1007/s10833-013-9215-8>
- Rees, C. A., & Roth, W. M. (2019). Discourse forms in a classroom transitioning to student-centred scientific inquiry through co-teaching. *International Journal of Science Education*, 41(5), 586–606. <https://doi.org/10.1080/09500693.2019.1571649>
- Sachs, J. (2005). Teacher education and the development of professional identity: Learning to be a teacher. In P. M. Denicolo & M. Kompf (Eds.), *Connecting policy and practice: Challenges for teaching and learning in schools and universities* (pp. 5–21). Routledge. <https://doi.org/10.4324/9780203012529-3>
- Saunders, R. (2013). The role of teacher emotions in change: Experiences, patterns and implications for professional development. *Journal of Educational Change*, 14(3), 303–333. <https://doi.org/10.1007/s10833-012-9195-0>
- Sherin, M. G. (2002). When teaching becomes learning. *Cognition and Instruction*, 20, 119–150. https://doi.org/10.1207/S1532690XCI2002_1
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4–14. <https://doi.org/10.3102/0013189X015002004>

- Skinner, B., Leavey, G., & Rothi, D. (2019). Managerialism and teacher professional identity: Impact on well-being among teachers in the UK. *Educational Review*, 73(1), 1–16. <https://doi.org/10.1080/00131911.2018.1556205>
- Smith, J. P. (1996). Efficacy and teaching mathematics by telling: A challenge for reform. *Journal for Research in Mathematics Education*, 27(4), 387–402. <https://doi.org/10.5951/jresmetheduc.27.4.0387>
- Spillane, J. P., Hopkins, M., & Sweet, T. M. (2018). School district educational infrastructure and change at scale: Teacher peer interactions and their beliefs about mathematics instruction. *American Educational Research Journal*, 55(3), 532–571. <https://doi.org/10.3102/0002831217743928>
- Sutton, R. E., & Wheatley, K. F. (2003). Teachers' emotions and teaching: A review of the literature and directions for future research. *Educational Psychology Review*, 15, 327–358. <https://doi.org/10.1023/A:1026131715856>
- Thompson, A. G. (1992). *Teachers' beliefs and conception. A synthesis of the research*. In D. A. Grouws (Ed.), *Handbook of research on mathematics teaching and learning* (pp. 127–146). Macmillan.
- Tyack, D., & Cuban, L. (1995). *Tinkering toward utopia: A century of public school reform*. Harvard University Press.
- Vähäsantanen, K. (2015). Professional agency in the stream of change: Understanding educational change and teachers' professional identities. *Teaching and Teacher Education*, 47, 1–12. <https://doi.org/10.1016/j.tate.2014.11.006>
- van Veen, K., & Sleegers, P. (2009). Teachers' emotions in a context of reforms: To a deeper understanding of teachers and reforms. In P. A. Schutz & M. Zembylas (Eds.), *Advances in teacher emotion research* (pp. 233–251). Springer. https://doi.org/10.1007/978-1-4419-0564-2_12
- Wilcox, K. C., & Lawson, H. A. (2018). Teachers' agency, efficacy, engagement, and emotional resilience during policy innovation implementation. *Journal of Educational Change*, 19, 181–204. <https://doi.org/10.1007/s10833-017-9313-0>
- Xu, J., Liu, H., & Huang, Y. T. (2021). The wolf is coming: How secondary teachers regulate emotional experiences when facing Chinese education reform. *Educational Studies*, 1–18. <https://doi.org/10.1080/03055698.2021.1886055>
- Yinger, R. (1979). Routines in teacher planning. *Theory into Practice*, 18(3), 163–169. <https://doi.org/10.1080/00405847909542827>
- Zembylas, M. (2010). Teacher emotions in the context of educational reforms. In A. Hargreaves, A. Lieberman, M. Fullan, & D. Hopkins (Eds.), *Second international handbook of educational change* (pp. 221–236). Springer. https://doi.org/10.1007/978-90-481-2660-6_13